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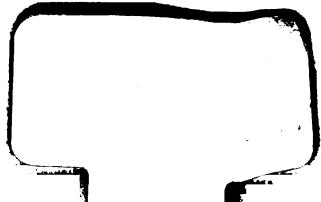
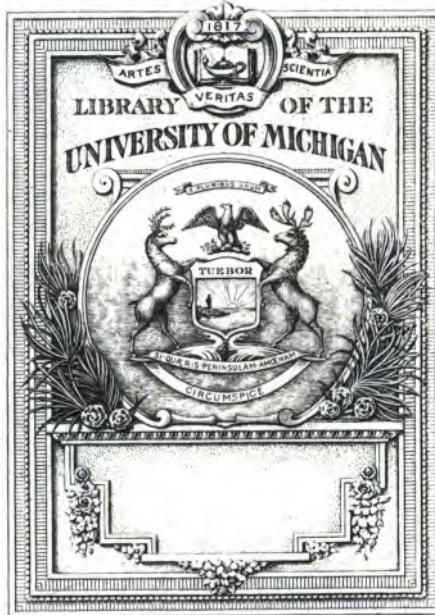
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THE
MORTALITY EXPERIENCE
OF THE
IMPERIAL FORCES
DURING THE
WAR IN SOUTH AFRICA,

11 OCTOBER 1899 to 31 MAY 1902.

BY
FREDERICK SCHOOLING, F.I.A.,
ONE OF THE HONORARY SECRETARIES OF THE INSTITUTE OF ACTUARIES AND
ACTUARY OF THE PRUDENTIAL ASSURANCE COMPANY.
AND
EDWARD A. RUSHER, F.I.A.,
ASSISTANT ACTUARY, PRUDENTIAL ASSURANCE COMPANY.

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THE MORTALITY EXPERIENCE OF THE IMPERIAL FORCES

DURING THE WAR IN SOUTH AFRICA,

11 OCTOBER 1899 TO 31 MAY 1902.

THE subject of War Mortality has not often been before the actuarial profession; there is a reference to the subject in Vol. iv of the *Journal*, and in Vol. vii there appear Mr. W. B. Hodge's papers on "The Mortality arising from Military Occupations", which give statistics ending with the Crimean War. The next reference to the subject is in Vol. xxxiv of the *Journal*, where Messrs. Smee and Ackland's valuable paper is given; this was first published in pamphlet form some years before its appearance in the *Journal*. In the same volume Mr. McLaughlin contributed a paper on general naval and military statistics, dealing principally with the ten years 1886-95, and an abstract of the tables is given in the *Transactions of the Second International Actuarial Congress*. There is also the well-known paper by Mr. A. G. Mackenzie published in the *Transactions of the Actuarial Society of Edinburgh* in 1881; and, finally, last year Mr. A. T. Anderson read a paper before the Actuarial Society of New South Wales which dealt with the mortality during the war now under consideration.

For the purpose of enabling general comparisons to be readily made, we append the following two tables, the first being extracted from Herr Klang's *Kriegs-Versicherungs-Vorlagen*, and the other from Mr. Mackenzie's paper. It should be borne in mind that the rates are for the whole duration of the campaigns unless otherwise specified, and not per annum or for any limited period. It may also be pointed out that Herr Klang's rate of mortality would probably be better defined as loss-rate, as in Mr. Mackenzie's paper, for the Text-Book definition of a rate of mortality certainly does not fit Herr Klang's facts.

*Rates of War Mortality in Different European Campaigns,
1854-1878 (HERR KLANG).*

Campaign and Date	Rate of Mortality
France in the Crimea, 1854-55	·103
France in Campaign of 1859	·056
Italy " "	·055
Austria " "	·047
North American Army, 1861-65	·054
Prussia in Campaign of 1864	·038
Austria " "	·040
Italy " 1866	·040
Prussia " "	·034
Bavaria " "	·051
Austria " "	·056
Germany " 1870-71	·042
Austria " 1878 (occupation of Bosnia-Herzegovina)	·015
General Average	·048

Comparative Losses from Battle and Disease (MACKENZIE).

	Losses per 100 from Battle	Proportion of Total Losses from Battle	Losses per 100 from Disease	Proportion of Total Losses from Disease	Total Losses per 100
Crimean War—					
English per annum .	3·3	·262	9·3	·738	12·6
French " .	3·4	·219	12·1	·781	15·5
American War—					
North, 1st year .	1·7	·254	5·0	·746	6·7
" 4 years .	3·9	·345	7·4	·645	11·2
Austro-Prussian War, 1866	1·4	·438	1·8	·562	3·2
Prussian Losses, 7 weeks }					

In this paper no attempt has been made to calculate the probability of war occurring, neither has attention been given to

the interesting question of the proportion of deaths to casualties. It was decided to confine its scope to the mortality experience of all classes of the Imperial Forces, distinguishing deaths by accident or disease from deaths by wounds, the latter class being understood to include all deaths on the battle-field itself.

For this purpose the Imperial Forces were divided into three classes, the combined experience being also given; in each class the experience of the officers was distinguished from that of the N.C.O's and men.

- (a) Regulars, Volunteers, and Militia.
- (b) Imperial Yeomanry.
- (c) Colonials, including the Forces raised in South Africa.

It was originally intended to give British Volunteers separately, but this was found to be impossible, as, with the exception of the C.I.V.'s, the Volunteers were attached to particular regiments. This fact prevented us obtaining with any degree of accuracy the number of Volunteers exposed to risk, so that the idea of giving a separate return for members of British Volunteer corps who went to South Africa had to be abandoned. The proportion of Volunteers to Regulars was a very small one, and consequently the effect of their inclusion amongst the Regulars would not be great, nor is it probable that their separate experience would yield important results.

Before closing these introductory remarks, we wish to place upon record our cordial thanks to the Secretary of State for War, and to the War Office authorities generally, for their kindness in giving us all the information in their power, and also for letting us have access to their returns and books. Without this help the paper would have lost much of its value, for, although we had records of the deaths, the published official returns did not give the numbers engaged at sufficiently frequent intervals to enable us to obtain with any approach to accuracy the "Exposed to risk."

Previous investigators have been much embarrassed by the large numbers of men returned as missing,—a difficulty which was happily absent on this occasion. In the war under consideration, the final total under the heading of missing and prisoners for the whole period of the war was only 105. Although many more were reported missing at various periods, courts-martial were held and the missing were traced in nearly every case. This may be looked upon as evidence that the sick and wounded were not lost sight of by those whose duty it was to tend them.

In addition to the experience deduced from published returns or particulars supplied to us by the War Office, we were fortunately in a position to trace accurately the experience of nearly 20,000 Imperial Yeomanry and Volunteers who were assured lives, exposed to over 250,000 months of risk of war, having an average duration of 13·3 months. As the ages were recorded in all these cases, the monetary results have been tabulated for seven groups of ages.

GENERAL MORTALITY OF IMPERIAL FORCES.

The first requisite was to obtain, if possible, the number engaged for each month of the war; for this purpose the following schedules were kindly filled up by the War Office.

SCHEDULE A.

Strength of Forces in South Africa.

	REGULARS AND VOLUNTEERS		MILITIA		IMPERIAL YEOMANRY		C. I. VOLUNTEERS	
	Officers	N.C.O's and Men	Officers	N.C.O's and Men	Officers	N.C.O's and Men	Officers	N.C.O's and Men
11 October 1899	...	...	...	...	...	...	...	...
1 November	1,869	53,234	...	...	...	...	...	...
1 December	2,764	81,252	...	...	...	...	...	...
1 January 1900	3,218	100,111	...	...	...	...	...	...
1 February	3,714	117,597	181	4,900	84	1,426	56	1,519
1 March	3,971	134,585	608	14,480	284	5,006	56	1,519
1 April	4,387	152,148	753	18,209	417	7,786	56	1,517
1 May	4,478	156,763	745	18,778	521	10,115	56	1,512
1 June	4,636	159,429	765	19,145	522	10,122	56	1,513
1 July	4,586	163,835	770	19,266	523	10,175	56	1,500
1 August	4,619	158,241	760	19,790	523	10,125	55	1,436
1 September	4,642	155,422	751	19,477	526	10,096	55	1,421
1 October	4,732	155,685	745	20,079	526	9,470	55	1,464
1 November	4,715	155,472	725	19,708	516	9,027	...	...
1 December	4,574	153,692	730	19,812	530	8,891	...	...
1 January 1901	4,551	149,801	725	19,081	530	8,024	...	...
1 February	4,550	149,618	715	18,988	530	7,882	...	...
1 March	4,579	150,047	700	18,402	571	10,565	...	...
1 April	4,659	154,824	732	19,367	845	21,982	...	...
1 May	4,746	148,440	779	19,726	960	23,376	...	...
1 June	4,793	145,597	740	17,900	876	20,349	...	...
1 July	4,795	143,422	837	20,734	813	18,603	...	...
1 August	4,801	140,711	727	17,300	793	17,955	...	...
1 September	4,788	141,681	711	17,003	783	17,330	...	...
1 October	4,829	140,492	693	16,452	773	16,962	...	...
1 November	4,750	138,426	665	15,932	773	16,125	...	...
1 December	4,757	139,761	658	15,728	773	15,758	...	...
1 January 1902	4,876	144,581	764	19,550	780	15,149	...	...
1 February	4,869	144,020	814	22,010	680	14,170	...	...
1 March	4,870	146,475	790	21,437	640	14,372	...	...
1 April	4,845	144,640	966	23,840	640	18,720	...	...
1 May	4,916	146,643	886	22,276	700	14,733	...	...
1 June	4,867	146,046	771	20,156	1,000	19,117	...	...

SCHEDULE B.

*Approximate Statement showing Strength of Colonial Forces
all kinds in South Africa on the date stated.*

Date	Colonials	South African Constabulary
1 December 1899	15,278	...
1 January 1900	18,762	...
1 February	22,796	...
1 March	26,069	...
1 April	26,944	...
1 May	31,037	...
1 June	33,512	...
1 July	35,747	...
1 August	43,150	...
1 September	42,775	...
1 October	42,097	...
1 November	42,097	...
1 December	39,302	...
1 January 1901	30,306	...
1 February	29,450	...
1 March	52,995*	1,467
1 April	54,852	5,634
1 May	56,086	5,234
1 June	54,909	7,401
1 July	54,159	7,430
1 August	53,625	7,461
1 September	52,912	7,516
1 October	51,952	8,743
1 November	51,527	9,117
1 December	51,448	8,883
1 January 1902	49,398	9,116
1 February	46,560	8,935
1 March	47,113	9,081
1 April	48,803	9,316
1 May	48,386	9,364
1 June	45,646	9,372

In cases where the figures on 1st of the month are not available, those for the nearest approximate date are given.

We find, upon enquiry at the War Office, that the numbers given in Schedule A represent, as the heading indicates, the strength of the forces in South Africa, and do not include drafts on their way out or returning. It will be observed that in Schedule B, referring to Colonials, commissioned officers have not been distinguished from N.C.O's and men. An investigation of returns made to Parliament gives the following approximate numbers of officers and men respectively.

* Includes 10,000 men raised in February locally by General Brabant, and additional oversea Colonials, i.e., Canada, New Zealand, &c.

Approximate Strength of Forces (Colonials).

	Officers	Men	Total
1 February 1901 . . .	1,339	27,000	28,339
1 May 1901 . . .	2,478	56,343	58,821
1 January 1902 . . .	2,300	55,000	57,300
	6,117	138,343	144,460

This shows a ratio of one officer to 22·6 men, the percentage of officers in this section to the total Colonial forces being 4·2344. By the use of this ratio, the figures given in Schedule B were divided into officers and men respectively, the resulting numbers being shown in the second column of Table II.

It may be observed here that amongst the Regulars and Volunteers the ratio was one officer to 30·6 men, and amongst the Yeomanry one officer to 20·6 men. Thus it will be seen that the proportion of officers amongst the Colonials approximated closely to that amongst the Yeomanry.

The South African Constabulary were included in Schedule A amongst the "Regulars and Volunteers"; consequently we have excluded them from the Colonials.

The deaths were ascertained from three independent sources:—
(a) a register wherein all deaths recorded in official lists supplied to the *Times* newspaper were tabulated in regiments daily from the commencement of the war, a folio being opened for each regiment or distinct corps, the cause of death being stated in each case, and we would here express our thanks to Mr. J. Blennerhassett of the Prudential for planning and keeping this register; (b) a printed list of casualties during the war, supplied by the South African authorities to the War Office; (c) the manuscript returns of casualties comprised in ten thick volumes belonging to the War Office. The card system was adopted as far as the deaths were concerned, a card being written for each of the 21,945 deaths observed. The facts recorded upon the cards were the regimental number, name, regiment, whether commissioned officer or not, date of death and cause of death. The deaths from wounds or on the battle-field were throughout distinguished from those from other causes, the word "Wounds" being employed to denote those from wounds or on the battle-field, and "Illness" those from other causes.

The comparison of these three records proved to be extremely laborious. It will be readily understood by those who have had any experience in compiling statistics that the comparison of the same details recorded by three altogether independent methods must necessarily produce many points for investigation. For example, it was found that the same death was occasionally reported twice over, the reason of this being that it was reported by different officers. Although the labour was great, it was not labour lost, for the results may now be looked upon with perfect confidence, a degree of accuracy having by means of these comparisons been attained which would be altogether impossible if figures were taken from official returns without analysis.

The following Table shows the distribution of these deaths for each calendar month of the war.

Tables II and III show the exposed to risk, the deaths, and the resulting monthly death-rates for each month of the war for each separate class; the exposed to risk being taken as the arithmetic mean of the figures supplied for each month in the first Schedule.

TABLE I.—Deaths from all causes during the War.

Month n	Officers										Non-Coms. and Men											
	Regulars, &c.			Yeomanry			Colonials			Regulars, &c.			Yeomanry			Colonials						
	Wounds	Illness	Total	Wounds	Illness	Total	Wounds	Illness	Total	Wounds	Illness	Total	Wounds	Illness	Total	Wounds	Illness	Total	Wounds	Illness	Total	
October 11 to 31 1899	21	1	22	...	...	...	...	...	...	146	15	161	...	...	...	15	3	18	...	...	...
November	17	...	17	...	...	...	1	3	4	215	40	255	...	...	...	8	2	10	58	13	71
December	37	...	37	...	...	...	2	1	3	426	86	512	...	...	...	17	17	34	77	22	99
January	6	41	47	...	...	...	...	...	...	417	280	697	...	...	...	5	5	10	40	45	85
February	15	73	88	...	...	...	13	...	13	688	375	1,063	...	...	...	77	22	99	17	17	34
March	17	32	50	...	...	...	5	8	8	238	623	861	1	8	9	40	45	85	19	19	38
April	12	26	34	...	...	...	2	7	7	105	823	928	2	17	19	53	57	130	42	42	84
May	11	38	49	4	1	5	5	4	9	201	1,402	52	85	87	42	42	84	126	101	130		
June	23	16	39	...	2	2	6	7	13	145	937	1,082	25	43	68	29	29	101	53	53	102	
July	15	11	26	2	2	4	7	7	7	151	514	665	17	36	53	49	53	102	25	25	76	
August	7	2	9	3	...	3	7	7	7	110	236	346	11	18	29	51	51	149	25	25	65	
September	3	1	4	1	1	2	1	2	2	53	173	226	10	18	28	39	39	149	30	30	65	
October	15	4	19	2	...	2	1	1	2	126	195	321	14	22	36	54	54	115	31	31	85	
November	8	6	14	1	1	2	8	1	9	99	287	386	12	25	37	45	45	89	44	44	89	
December	14	12	26	2	...	2	2	2	3	5	193	439	632	20	54	74	43	43	87	44	44	87
January	8	14	22	...	1	1	9	3	12	114	530	644	18	47	66	62	62	149	40	40	93	
February	6	13	19	1	2	3	1	4	5	103	508	611	15	30	45	40	40	93	53	53	93	
March	4	10	14	1	2	3	10	2	12	74	359	433	12	29	41	47	47	88	115	115	85	
April	4	10	14	...	1	1	2	3	5	67	321	388	9	41	50	43	43	98	55	55	98	
May	6	10	18	2	10	7	3	10	106	426	532	43	65	108	55	55	129	70	70	152		
June	7	15	22	3	8	5	1	1	6	86	261	347	27	75	102	53	53	92	39	39	92	
July	6	1	7	6	...	6	4	1	5	82	150	232	22	30	52	53	53	92	47	47	92	
August	6	4	10	1	1	5	4	4	9	72	115	187	27	20	47	31	48	79	48	48	79	
September	16	4	20	3	1	4	6	6	6	175	105	280	41	18	59	59	59	96	37	37	96	
October	22	3	25	6	...	6	7	1	8	118	185	253	38	22	60	55	55	122	42	42	122	
November	8	3	11	4	1	5	4	4	8	64	232	296	14	28	42	34	34	93	59	59	93	
December	16	8	24	9	1	10	2	1	3	96	350	446	82	60	142	27	27	86	113	113	135	
January	10	8	18	3	1	4	4	4	4	64	409	473	22	89	111	52	52	83	103	103	135	
February	18	13	31	7	6	13	4	4	4	120	497	52	106	158	58	103	103	139	73	73	139	
March	12	8	20	...	2	2	2	2	2	68	313	381	27	62	89	22	22	62	66	66	139	
April	12	15	27	2	1	1	2	2	2	63	257	320	17	23	40	22	22	57	48	48	57	
May	1	9	10	...	1	1	2	2	2	4	26	245	271	7	16	23	9	9	57	48	48	57
	454	277	731	73	30	103	136	64	200	4,811	11,317	16,128	637	10,422	16,179	1,447	1,447	3,104	1,657	1,657	3,104	

TABLE II.—Officers—Regulars &c.

Month No. (1)	Strength of Force on 1st of Month (2)	Sum of Column (2) for months n and n+1 (3)	E (4)	DEATHS DURING MONTH			MONTHLY DEATH-RATE PER 1,000		
				Wounds (5)	Illness (6)	Total (7)	Wounds (8)	Illness (9)	Total (10)
October 11 to 31 1899	857	2,726	909	21	1	22	23,102	1,100	24,202
November	1,869	4,938	2,317	17	...	37	7,337	...	7,337
December	2,764	5,982	2,991	37	...	41	12,370	...	12,370
January	3,218	7,169	3,584	35	6	41	9,763	1,674	11,437
February	3,951	8,581	4,291	58	15	73	13,517	3,496	17,013
March	4,680	9,886	4,918	15	17	32	8,053	8,460	6,513
April	5,196	10,475	5,237	14	12	26	2,673	2,291	4,964
May	5,279	10,736	5,368	11	88	49	2,049	7,079	9,128
June	5,457	10,869	5,435	23	16	39	4,232	2,944	7,176
July	6,412	10,846	6,423	15	11	26	2,766	2,028	4,794
August	5,424	10,982	5,441	7	2	9	1,287	3,68	1,655
September	6,448	10,980	6,490	3	1	4	546	1,182	728
October	5,532	10,972	5,496	15	4	19	2,734	729	3,463
November	5,440	10,744	5,372	8	6	14	1,489	1,117	2,606
December	5,304	10,580	5,290	14	12	26	2,647	2,268	4,915
January	5,276	10,541	5,270	8	14	22	1,518	2,656	4,174
February	5,265	10,544	5,272	6	13	19	1,138	2,466	3,604
March	5,279	10,970	5,335	4	10	14	750	1,874	2,624
April	5,381	10,916	5,458	4	10	14	733	1,832	2,565
May	5,525	11,058	5,529	4	6	10	723	1,085	1,808
June	5,533	11,165	5,583	8	7	15	1,433	1,254	2,687
July	5,632	11,160	5,580	6	1	7	1,075	179	1,254
August	5,528	11,027	5,613	6	4	10	1,088	725	1,813
September	5,499	11,021	5,511	16	4	20	2,903	726	3,629
October	5,522	10,987	5,468	22	3	25	4,023	549	4,572
November	5,415	10,930	5,415	8	3	11	1,477	554	2,031
December	5,415	11,055	5,528	16	8	24	2,894	1,447	4,341
January	5,640	11,323	5,661	10	8	18	1,766	1,413	3,179
February	5,683	11,343	5,672	18	13	31	3,173	2,292	5,465
March	5,660	11,471	5,735	12	8	20	2,092	1,395	3,487
April	5,811	11,613	5,807	12	15	27	2,066	2,583	4,649
May	5,802	11,440	5,720	1	9	10	175	1,573	1,748
June	5,658	...	...	...	...	...	...	...	...
	...	...	161,604	454	277	731	2,809	1,714	4,523

TABLE II (continued).—*Officers—Imperial Yeomanry.*

Month n	Strength of Force on 1st of Month (2)	Sum of Column (2) for months n and n+1 (3)	E (4)	DEATHS DURING MONTH			MONTHLY DEATH-RATE PER 1,000		
				Wounds (6)	Illness (6)	Total (7)	Wounds (8)	Illness (9)	Total (10)
October 11 to 31 1899	...	...	...	...	...	...	...	...	...
November	...	...	...	...	...	...	...	...	...
December	...	...	...	...	...	...	...	...	...
January	1900	84	368	184	...	...	...	...	...
February	...	284	701	361	2	2	4264	...	4264
March	417	938	469	2	1	5	7663	1916	9579
April	521	1,043	522	4	2	5	...	3824	8824
May	522	1,045	523	2	2	4	...	3824	7648
June	523	1,046	523	2	2	4	6714	...	6714
July	523	1,049	525	3	3	6	...	1901	1901
August	526	1,052	526	1	1	2	3839	...	3839
September	526	1,042	521	2	1	3	...	1912	3824
October	516	1,046	523	1	1	2	3774	...	3774
November	530	1,060	530	2	2	4	1887	1887	1887
December	1901	530	1,060	530	1	1	3	3630	5445
January	530	1,101	551	1	2	3	1412	2825	4237
February	571	1,416	708	1	2	3	...	1107	1107
March	845	1,805	903	1	1	1	...	2179	10894
April	960	1,836	918	8	2	10	8715	...	8715
May	876	1,689	845	5	3	8	5917	3550	9467
June	818	1,606	803	6	6	6	7472	...	7472
July	798	1,576	788	1	1	1	1269	...	1269
August	783	1,656	778	3	1	4	8856	1285	5141
September	773	1,546	773	6	6	6	7762	...	7762
October	773	1,546	773	4	1	5	6176	1284	6469
November	773	1,553	777	9	1	10	11583	1287	1287
December	780	1,410	705	3	1	4	4265	1418	6673
January	630	1,270	635	7	6	13	11024	9449	20473
February	640	1,280	640	2	2	2	...	3125	3125
March	600	1,340	670	2	1	2	2985	...	2985
April	700	1,700	850	...	1	1	...	1176	1176
May	1,000	...	...	...	...	...	...	...	...
June	...	17844	73	...	...	...	103	4091	1681

TABLE II (continued).—Officers—Colonials.

Month n (1)	Strength of Force on 1st of Month (2)	Sum of Column (2) for months n and n+1 (3)	E (4)	DEATHS DURING MONTH			MONTHLY DEATH-RATE PER 1,000		
				Wounds (5)	Illness (6)	Total (7)	Wounds (8)	Illness (9)	Total (10)
October 11 to 31 1899	...	...	...	...	...	...	...	...	...
November	647	1,441	720	2	1	3	2778	1389	4167
December	794	1,769	880	13	8	18	12573	4452	12573
January	965	2,089	1,034	5	3	8	4452	2671	7123
February	1,104	2,245	1,123	5	2	7	4075	1630	5705
March	1,141	2,455	1,227	5	4	9	87658	2926	6584
April	1,314	2,733	1,367	5	7	13	4093	4775	8868
May	1,419	2,983	1,466	6	...	7	4189	...	4189
June	1,514	3,341	1,671	7	...	7	3848	...	3848
July	1,827	3,638	1,819	7	...	7	1113	...	1113
August	1,811	3,594	1,797	2	1	2	561	561	1122
September	1,788	3,566	1,783	1	1	2	4643	580	5223
October	1,738	3,447	1,723	8	1	9	1357	2035	3392
November	1,664	2,947	1,474	2	3	5	7115	2372	9487
December	1,901	2,580	1,265	9	3	12	573	2292	2865
January	1,247	3,491	1,745	1	4	5	4378	876	5254
February	2,244	4,567	2,284	10	2	12	851	1277	2128
March	2,933	4,598	2,349	2	3	5	2979	1277	4256
April	2,875	4,700	2,350	7	3	10	2165	433	2598
May	2,335	4,618	2,309	5	1	6	1753	438	2191
June	2,293	4,564	2,282	4	1	5	2216	1773	3989
July	2,271	4,512	2,256	5	4	9	2708	...	2703
August	2,241	4,441	2,220	6	...	6	3195	456	3651
September	2,200	4,382	2,191	7	1	8	1834	1834	3668
October	2,182	4,361	2,181	4	4	8	937	468	1405
November	2,179	4,271	2,135	2	1	3	1969	1969	1969
December	2,092	4,064	2,032	4	4	4	2016	2016	4032
January	1,972	3,967	1,984	4	4	8	1969	985	2954
February	1,936	4,062	2,031	4	2	6	1458	1458	1458
March	2,067	4,116	2,058	3	3	3	1005	1005	2010
April	2,049	3,982	1,991	2	2	4	...	...	...
May	1,983	...	...	...	...	...	...	...	...
June	...	...	53,747	135	64	199	2512	1191	3703

TABLE II (continued).—Officers—All Classes Combined.

Month n (1)	Strength of Force on 1st of Month (2)	E (3)	DEATHS DURING MONTH			MONTHLY DEATH-RATE PER 1,000		
			Wounds (4)	Illness (5)	Total (6)	Wounds (7)	Illness (8)	Total (9)
October 11 to 31 1899	857	909	21	1	22	23-102	1-100	24-202
November	1,869	2,317	17	17	34	7-387	...	7-387
December	3,411	3,711	39	1	40	10-509	...	10-778
January 1900	4,012	4,464	95	6	41	7-841	1-344	9-185
February	5,000	6,509	71	16	86	12-888	2-723	15-611
March	6,018	6,387	20	20	40	3-132	3-132	6-264
April	6,754	6,933	21	14	35	3-029	2-019	5-048
May	7,114	7,257	20	43	63	2-756	5-926	8-682
June	7,398	7,424	29	25	54	3-906	3-367	7-273
July	7,449	7,617	24	13	37	3-151	1-707	4-858
August	7,784	7,785	17	2	19	2-184	...	2-441
September	7,785	7,813	6	1	7	7-768	1-128	8-96
October	7,841	7,790	18	5	23	2-311	1-642	2-953
November	7,739	7,618	17	8	25	2-232	1-050	3-232
December	7,498	7,294	18	15	33	2-468	2-056	4-524
January 1901	7,089	7,065	17	18	35	2-406	2-548	4-954
February	7,042	7,568	8	19	27	1-057	2-511	3-568
March	8,094	8,327	15	14	29	1-801	1-681	3-482
April	8,559	8,710	6	14	20	1-689	1-608	2-297
May	8,860	8,797	19	11	30	2-160	1-250	3-410
June	8,734	8,737	18	11	29	2-060	1-259	3-319
July	8,738	8,666	16	2	18	1-847	1-231	2-078
August	8,592	8,557	12	8	20	1-402	1-985	2-387
September	8,523	8,509	25	5	30	2-938	1-588	3-526
October	8,495	8,432	95	4	99	4-151	1-474	4-625
November	8,370	8,419	16	8	24	1-900	1-950	2-850
December	8,367	8,490	27	10	37	3-180	1-178	4-358
January 1902	8,512	8,398	13	13	26	1-548	1-548	3-096
February	8,285	8,291	29	23	52	3-498	2-774	6-272
March	8,295	8,406	16	12	28	1-903	1-428	3-381
April	8,518	8,535	14	18	32	1-640	2-109	3-749
May	8,551	8,561	3	12	15	1-350	1-402	1-752
June	8,671	...	...	...	...	...	...	...
		283,195	662	371	1,033	2-839	1-591	4-430

TABLE II (continued).—N.C.O's and Men—Regulars &c.

Month # (1)	Strength of Force on 1st of Month (2)	Sum of Contingent (2) for months n and n+1 (3)	E (4)	DEATHS DURING MONTH			Wounds (8)	Illness (9)	Monthly Death-Rate per 1,000 Total (10)
				Wounds (5)	Illness (6)	Total (7)			
October 11 to 31 1899	21,629	74,863	24,954	146	15	161	5,851	.601	6,462
November .	53,234	134,486	67,243	215	40	255	3,197	.595	3,792
December .	81,252	181,363	90,681	426	86	512	4,698	.948	5,646
January .	100,111	224,127	112,064	417	280	697	3,721	2,499	6,220
February .	124,016	244,600	137,800	688	375	1,063	5,011	2,731	7,742
March .	160,584	322,458	161,229	238	623	861	1,476	3,864	5,340
April .	171,874	348,927	174,468	105	823	928	.602	4,717	5,319
May .	177,063	357,140	178,570	201	1,201	1,402	1,126	6,726	7,852
June .	180,087	364,688	182,844	145	937	1,082	.795	5,139	5,984
July .	184,601	364,068	182,034	151	514	665	.830	2,824	3,654
August .	179,467	355,757	177,878	110	236	346	.618	1,327	1,945
September .	176,290	355,518	176,759	53	173	226	.800	.979	1,279
October .	177,228	359,408	176,204	126	195	321	.715	1,107	1,822
November .	175,180	348,184	174,092	99	287	386	.569	1,649	2,218
December .	173,004	341,886	170,943	193	439	632	1,129	2,568	3,697
January .	168,882	337,488	168,744	114	530	644	.676	3,141	3,817
February .	168,606	337,055	168,527	103	508	611	.611	8,014	3,625
March .	168,449	342,640	171,320	74	359	433	.432	2,095	2,527
April .	174,191	342,357	171,179	67	321	388	.391	1,875	2,266
May .	168,166	331,663	165,832	106	426	532	.639	2,569	3,208
June .	163,497	327,653	163,827	86	261	347	.525	1,593	2,118
July .	164,156	322,167	161,068	82	150	282	.509	.931	1,440
August .	158,011	315,695	158,348	72	115	187	.455	.726	1,181
September .	158,684	315,628	157,814	175	105	280	1,109	.665	1,774
October .	156,944	311,302	155,651	118	135	263	.758	.867	1,625
November .	154,358	309,847	154,924	64	232	296	.413	1,498	1,911
December .	155,459	319,620	159,810	96	350	446	.601	2,190	2,791
January .	164,181	330,161	165,080	64	409	473	.388	2,478	2,866
February .	166,030	333,942	166,971	120	877	497	.719	2,258	2,977
March .	167,912	336,392	168,196	68	313	381	.404	1,861	2,265
April .	168,480	337,399	168,700	63	257	320	.373	1,523	1,896
May .	168,319	335,121	167,561	26	245	271	.155	1,462	1,617
June .	166,202	...	...	...	...	...	...	...	...
	...	4,980,325	4,811	11,317	16,128	.966	2,272	3,288	

TABLE II (continued).—N.C.O's and Men—Imperial Yeomanry.

Month n (1)	Strength of Force on 1st of Month (2)	DEATHS DURING MONTH						MONTHLY DEATH-RATE PER 1,000		
		Sum of Column (2) for months n and n+1 (3)	E (4)	Wounds (5)	Illness (6)	Total (7)	Wounds (8)	Illness (9)	Total (10)	
October 11 to 31 1899	...	...	...	...	...	...	...	...	...	...
November . . . . .	...	...	...	...	...	...	...	...	...	...
December	1,426	6,432	3,216	...	5	5	...	...	1,555	1,555
January	1,426	12,792	6,396	1	8	9	156	1,251	1,407	1,407
February	5,006	17,901	8,951	2	17	19	223	1,899	2,122	2,122
March	7,786	20,237	10,119	62	35	87	5139	8,459	8,598	8,598
April	10,115	20,297	10,149	25	43	68	2,463	4,237	6,700	6,700
May	10,122	20,300	10,150	17	36	53	1,675	3,547	5,222	5,222
June	10,175	20,221	10,111	11	18	29	1,088	1,780	2,868	2,868
July	10,125	19,566	9,783	10	18	28	1,022	1,840	2,862	2,862
August	10,096	18,497	9,249	14	22	36	1,514	2,379	3,893	3,893
September	9,470	17,918	8,959	12	25	37	1,389	2,790	4,129	4,129
October	9,027	16,915	8,455	20	54	74	2,365	6,384	8,749	8,749
November	8,891	15,906	7,953	18	47	65	2,268	5,910	8,173	8,173
December	1901	18,447	9,224	15	30	45	1,626	3,252	4,878	4,878
January	7,882	32,547	16,274	12	29	41	737	1,782	2,519	2,519
February	10,565	21,982	45,358	22,679	9	41	50	1,808	2,205	4,940
March	23,376	43,725	21,863	43	65	108	1,967	2,973	5,237	5,237
April	20,349	38,952	19,476	27	75	102	1,386	3,851	5,910	5,910
May	18,603	36,558	18,279	22	30	52	1,204	1,641	2,845	2,845
June	17,955	35,285	17,643	27	20	47	1,530	1,134	2,664	2,664
July	17,380	34,292	17,146	41	18	59	2,391	1,050	3,441	3,441
August	16,962	33,087	16,544	38	22	60	2,297	1,330	3,627	3,627
September	16,125	31,883	16,942	14	28	42	878	1,756	2,634	2,634
October	15,758	30,907	15,454	82	60	142	5,906	3,882	9,188	9,188
November	15,149	29,319	14,660	22	89	111	1,601	6,071	7,572	7,572
December	14,170	28,542	14,271	52	106	158	3,644	7,428	11,072	11,072
January	14,372	28,092	14,046	27	62	89	1,922	4,414	6,336	6,336
February	13,720	28,498	14,247	17	23	40	1,193	1,614	2,807	2,807
March	14,773	33,890	16,945	7	16	23	413	944	1,357	1,357
April	19,117	...	...	...	...	...	...	...	...	...
May . . . . .	...	368,187	637	1,042	1,679	1,730	2,930	4,560	4,560	4,560

TABLE II (continued).—N.C.O.'s and Men—Colonials.

Month n (1)	Strength of Force on 1st of Month (2)	Sum of Column (2) for months n and n+1 (3)	E (4)	Deaths during Month			Monthly Death-Rate per 1,000		
				Wounds (5)	Illness (6)	Total (7)	Wounds (8)	Illness (9)	Total (10)
December 1899	14,631	32,599	16,299	58	13	71	3,559	.798	4,357
January 1900	17,568	39,799	19,900	17	17	34	.854	.854	1,708
February	21,831	46,796	23,398	77	22	99	3,291	.910	4,231
March	24,965	50,768	25,384	40	45	85	1,576	1,773	3,349
April	25,803	55,526	27,763	53	77	130	1,909	2,773	4,682
May	23,723	61,816	30,908	42	84	126	1,359	2,718	4,077
June	32,093	66,326	38,163	29	101	130	.874	3,046	3,920
July	34,233	76,656	37,778	49	53	102	1,297	1,903	2,700
August	41,323	82,287	41,143	51	25	76	1,240	.606	1,848
September	40,964	81,278	40,639	39	26	65	.960	.640	1,600
October	40,314	80,628	40,814	54	31	85	1,389	.769	2,108
November	40,314	79,952	38,976	45	44	89	1,155	1,129	2,284
December	37,638	66,661	33,381	43	44	87	1,290	1,820	2,610
January 1901	29,023	57,226	28,618	62	87	149	2,167	3,041	5,208
February	28,203	78,954	39,477	40	58	93	1,013	1,948	2,936
March	50,751	103,280	51,640	47	68	115	.910	1,317	2,227
April	52,529	106,240	53,120	43	55	98	.809	1,036	1,844
May	53,711	106,295	53,147	55	74	129	1,035	1,392	2,427
June	62,884	104,450	52,225	82	70	152	1,570	1,340	2,910
July	51,866	103,220	51,610	53	39	92	1,027	.756	1,753
August	61,354	102,025	50,018	31	48	79	.608	.941	1,549
September	50,671	100,423	50,211	59	37	96	1,175	.737	1,912
October	49,762	99,097	49,549	80	42	122	1,615	.843	2,468
November	49,345	98,614	49,307	34	59	93	.690	1,197	1,987
December	49,269	96,576	48,287	27	86	113	.659	1,781	2,340
January 1902	47,906	91,894	45,947	52	88	135	1,132	1,806	2,938
February	44,588	89,706	44,853	58	103	161	1,293	2,296	3,589
March	45,118	91,854	45,927	73	66	139	1,589	1,497	3,026
April	46,736	93,078	46,537	22	52	74	.473	1,117	1,590
May	46,337	90,050	45,025	9	48	57	.200	1,066	1,266
June	43,713	...	...	...	...	...	...	...	...
		...	1,215,484	1,424	1,652	3,076	1,172	1,359	2,531

TABLE I.—Deaths from all causes during the War.

Month n	Non-Coms. and Men											
	Officers				Yeomanry				Colonials			
	Regulars, &c.	Wounds	Illness	Total	Wounds	Illness	Total	Wounds	Illness	Total	Wounds	Illness
October 11 to 31 1899	21	1	22	...	...	...	...	146	15	161	...	...
November	17	17	37	...	...	1	2	215	40	255	...	...
December	37	...	41	...	...	3	1	426	86	512	...	...
January	6	35	41	...	...	...	...	417	280	697	...	...
February	15	58	73	...	...	13	...	688	375	1,063	...	...
March	17	58	32	...	...	5	3	238	861	1	5	5
April	14	12	26	2	2	5	2	105	823	928	2	17
May	11	38	49	4	1	5	5	9	201	1,402	52	35
June	23	16	39	...	2	2	6	7	145	937	1,082	25
July	15	11	26	2	4	7	7	7	151	614	665	17
August	7	2	9	3	...	8	7	7	110	236	346	11
September	3	1	4	1	...	1	2	2	53	173	226	10
October	15	4	19	2	...	2	1	1	126	195	321	14
November	8	6	14	1	1	2	8	1	99	287	386	12
December	14	12	26	2	...	1	2	3	5	193	439	632
January	8	14	22	...	1	1	9	3	12	114	530	644
February	6	13	19	1	2	3	1	4	5	103	508	611
March	4	10	14	1	2	3	10	2	12	74	359	433
April	4	10	14	...	1	2	1	2	3	67	321	388
May	4	6	10	8	2	10	7	3	10	106	426	532
June	8	7	15	5	3	8	5	1	6	86	261	347
July	6	1	7	6	...	6	4	1	5	82	150	232
August	6	4	10	3	1	1	5	4	9	72	115	187
September	16	4	20	3	1	4	6	6	175	105	280	41
October	22	3	25	6	...	6	7	1	8	118	135	253
November	8	3	11	4	1	5	4	4	8	64	232	296
December	16	8	24	9	1	10	2	1	3	96	350	446
January	10	8	18	3	1	4	4	4	4	64	409	473
February	18	13	31	7	6	13	4	4	8	120	377	497
March	12	8	20	...	2	2	4	2	6	68	313	381
April	12	15	27	2	...	2	3	3	3	63	257	320
May	1	9	10	...	1	1	2	2	4	26	245	271
	454	27	731	73	30	103	136	64	200	4,811	11,317	16,128
										637	1,042	1,679
											1,447	1,657
												3,104

TABLE II.—Officers—Regulars &c.

Month n (1)	Strength of Force on 1st of Month (2)	Sum of Column (2) for months n and n+1 (3)	E (4)	DEATHS DURING MONTH			MONTHLY DEATH-RATE PER 1,000		
				Wounds (5)	Illness (6)	Total (7)	Wounds (8)	Illness (9)	Total (10)
October 11 to 31 1889	857	2,726	909	21	1	22	23,102	1,100	24,202
November	1,869	4,638	2,317	17	...	37	7,337	...	7,337
December	2,764	5,982	2,891	87	...	41	12,370	11,427	12,370
January	1,900	3,218	3,584	35	6	41	9,763	1,674	11,427
February	3,951	8,581	4,291	58	15	73	13,517	3,486	17,013
March	4,630	9,826	4,913	15	17	32	8,053	8,460	6,513
April	5,196	10,475	5,287	14	12	26	2,673	2,291	4,964
May	5,279	10,736	5,368	11	88	49	2,049	7,079	9,128
June	5,457	10,869	5,435	23	16	39	4,232	2,944	7,176
July	6,412	10,846	6,423	15	11	26	2,766	2,028	4,794
August	5,434	10,882	5,441	7	2	9	1,287	3,958	1,655
September	6,448	10,980	6,490	3	1	4	546	1,182	728
October	5,532	10,972	5,486	15	4	19	2,794	729	3,463
November	6,440	10,744	6,372	8	6	14	1,489	1,117	2,606
December	5,304	10,580	5,290	14	12	26	2,647	2,268	4,915
January	1,901	5,276	10,541	5,270	8	14	22	1,518	2,656
February	5,265	10,544	5,272	6	13	19	1,188	2,466	3,604
March	5,279	10,670	5,335	4	10	14	750	1,874	2,624
April	5,391	10,916	5,458	4	10	14	783	1,882	2,565
May	5,525	11,058	5,529	4	6	10	723	1,085	1,808
June	5,533	11,165	5,583	8	7	15	1,463	1,254	2,687
July	5,632	11,160	5,580	6	1	7	1,075	1,179	1,254
August	5,528	11,027	5,613	6	4	10	1,088	726	1,813
September	5,499	11,021	5,511	16	4	20	2,903	726	3,629
October	5,522	10,937	5,468	22	3	25	4,023	549	4,572
November	5,415	10,830	5,415	8	3	11	1,477	554	2,031
December	6,415	11,055	5,528	16	8	24	2,894	1,447	4,341
January	5,640	11,323	5,661	10	8	18	1,766	1,413	3,179
February	5,683	11,348	5,672	18	13	31	3,173	2,292	5,465
March	5,660	11,471	5,735	12	8	20	2,092	1,395	3,487
April	5,811	11,613	5,807	12	15	27	2,066	2,583	4,649
May	6,802	11,440	5,720	1	9	10	1,176	1,573	1,748
June	5,638	...	...	...	...	...	...	...	...
	...	...	161,604	454	277	731	2,809	1,714	4,523

TABLE II (continued).—Officers—Imperial Yeomanry.

Month n (1)	Strength of Force on 1st of Month (2)	DEATHS DURING MONTH						MONTHLY DEATH-RATE PER 1,000			
		E		Wounds (6)		Illness (6)		Wounds (8)		Illness (9)	
		Sum of Column (2) for months n and n+1 (3)	(4)	...	...	...	...	...	...	...	...
October 11 to 31 1899	...	...	...	...	...	...	...	...	...	...	...
November	...	...	...	...	...	...	...	...	...	...	...
December	...	...	...	...	...	...	...	...	...	...	...
January	1900	84	368	184	...	...	...	...	...	...	...
February	284	701	351	2	...	...	2	4264	...	4264	...
March	417	938	469	1	5	7663	1916	9579	...	9579	...
April	521	1,043	522	4	2	...	3	3824	3824	7648	...
May	522	1,045	523	2	2	...	2	3824	3824	7648	...
June	523	1,046	523	2	2	...	3	5714	...	5714	...
July	523	1,049	525	3	3	...	1	1901	...	1901	...
August	526	1,052	526	1	1	...	2	3839	3839	8389	...
September	526	1,042	521	2	1	...	2	1912	1912	8324	...
October	516	1,046	523	1	1	...	2	8774	8774	3774	...
November	530	1,060	580	2	1	...	1	1887	1887	1887	...
December	1901	530	1,060	530	...	1	2	3	1815	3630	5445
January	530	1,101	551	1	1	...	3	1412	2825	4237	...
February	571	1,416	708	1	2	...	3	...	1107	1107	1107
March	845	1,805	903	...	1	1	1	...	8715	2179	10894
April	960	1,836	918	8	2	...	10	5917	3550	9467	...
May	876	1,689	845	5	3	...	8	7472	...	7472	...
June	813	1,606	803	6	6	...	6	1269	...	1269	...
July	793	1,576	788	1	1	...	1	8856	1285	5141	...
August	783	1,656	778	3	1	...	4	7762	7762	7762	...
September	773	1,546	773	6	1	...	6	5175	1284	6469	...
October	773	1,546	773	4	1	...	5	11583	1287	12870	...
November	773	1,553	777	9	1	...	10	4256	1418	5673	...
December	780	1,410	705	3	1	...	4	11024	9449	20473	...
January	630	1,270	686	7	6	...	13	3125	3125	8125	...
February	640	1,280	640	2	2	...	2	2985	2985	2985	...
March	640	1,340	670	2	1	...	1	...	1176	1176	1176
April	700	1,700	850	...	...	...	...	...	...	...	...
May	1,000	...	...	17844	73	30	103	4091	1681	5772	...

TABLE II (continued).—Officers—Colonials.

Month #	Strength of Force on 1st of Month (1)	Sum of Column (2) for months n and n+1 (3)	E (4)	DEATHS DURING MONTH			MONTHLY DEATH-RATE PER 1,000		
				Wounds (5)	Illness (6)	Total (7)	Wounds (8)	Illness (9)	Total (10)
October 11 to 31 1899	...	...	...	...	...	...	...	...	...
November	647	1,441	720	2	1	3	2778	1389	4,167
December	794	1,759	880	1,084	13	13	12,573	...	...
January	1900	965	2,069	1,123	5	8	4,452	2,671	7,123
February	1,104	2,245	1,227	5	2	7	4,075	1,630	5,705
March	1,141	2,455	1,367	5	4	9	3,658	2,926	6,584
April	1,314	2,783	1,466	6	7	13	4,093	4,775	8,868
May	1,419	2,933	1,466	7	7	13	4,189	...	4,189
June	1,514	3,941	1,671	7	7	13	3,848	...	3,848
July	1,827	3,688	1,819	7	7	13	1,113	...	1,113
August	1,811	3,594	1,797	2	2	2	561	561	1,122
September	1,783	3,565	1,783	1	1	2	4,643	580	5,223
October	1,788	3,447	1,723	8	1	9	1,357	2,085	3,392
November	1,664	2,947	1,474	2	3	5	7,115	2,372	9,487
December	1,283	2,580	1,265	9	3	12	573	2,292	2,865
January	1,247	3,491	1,745	1	4	5	4,378	876	5,264
February	2,244	4,567	2,284	10	2	12	851	1,277	2,128
March	2,323	4,698	2,349	2	3	5	2,979	1,277	4,256
April	2,375	4,700	2,350	7	3	10	2,165	433	2,598
May	2,325	4,618	2,309	5	1	6	1,763	438	2,191
June	2,293	4,564	2,282	4	1	5	2,216	1,773	3,989
July	2,271	4,512	2,256	5	4	9	2,703	...	2,703
August	2,241	4,441	2,220	6	..	6	3,195	456	3,651
September	2,200	4,382	2,191	7	1	8	1,834	1,834	3,668
October	2,182	4,361	2,181	4	1	5	937	468	1,405
November	2,179	4,271	2,135	2	1	3	1,969	1,969	1,969
December	2,092	4,064	2,032	..	4	4	2,016	2,016	4,032
January	1,972	3,967	1,984	4	4	8	1,969	985	2,954
February	1,995	4,062	2,031	4	2	6	1,458	1,458	2,458
March	2,067	4,116	2,058	6	3	9	1,005	1,005	2,010
April	2,049	3,982	1,991	2	2	4	...	...	...
May	1,983	...	...	...	...	...	2512	1191	3,703
June	...	...	...	...	...	...	199	...	...

TABLE II (continued).—Officers—All Classes Combined.

Month n (1)	Strength of Force on 1st of Month (2)	E (3)	DEATHS DURING MONTH			MONTHLY DEATH RATE PER 1,000		
			Wounds (4)	Illness (5)	Total (6)	Wounds (7)	Illness (8)	Total (9)
October 11 to 31 1899	867	909	21	1	22	23.102	1.100	24.202
November . . .	1,869	2,317	17	1	17	7.387	...	7.337
December . . .	3,411	3,711	39	1	40	10.509	2.69	10.778
January . . . 1900	4,012	4,464	35	6	41	7.841	1.344	9.185
February . . .	5,000	5,509	71	15	86	12.888	2.723	15.611
March . . .	6,018	6,387	20	20	40	8.182	3.192	6.264
April . . .	6,754	6,933	21	14	35	3.029	2.019	5.048
May . . .	7,114	7,257	20	43	63	2.766	5.926	8.682
June . . .	7,398	7,424	29	25	54	3.906	3.367	7.273
July . . .	7,449	7,617	24	13	37	3.151	1.707	4.858
August . . .	7,784	7,785	17	2	19	2.184	2.507	2.441
September . . .	7,785	7,813	6	1	7	.768	.128	.896
October . . .	7,841	7,790	18	5	23	2.311	.642	2.953
November . . .	7,739	7,618	17	8	25	2.232	1.050	3.282
December . . .	7,498	7,294	18	15	33	2.468	4.624	4.656
January . . . 1901	7,089	7,065	17	18	35	2.406	2.548	4.954
February . . .	7,042	7,568	8	19	27	1.057	2.511	3.568
March . . .	8,094	8,327	15	14	29	1.801	1.681	3.482
April . . .	8,559	8,710	6	14	20	.689	1.608	2.237
May . . .	8,860	8,797	19	11	30	2.160	1.260	3.410
June . . .	8,734	8,737	18	11	29	2.060	1.269	3.319
July . . .	8,738	8,665	16	2	18	1.847	.281	2.078
August . . .	8,6502	8,557	12	8	20	1.402	.935	2.337
September . . .	8,523	8,509	25	5	30	2.938	.558	3.526
October . . .	8,405	8,432	35	4	39	4.151	.474	4.625
November . . .	8,370	8,419	16	8	24	1.900	.950	2.850
December . . .	8,367	8,490	27	...	37	3.180	1.178	4.358
January . . . 1902	8,512	8,398	13	13	26	1.548	1.548	3.096
February . . .	8,285	8,291	29	23	62	3.493	2.774	6.272
March . . .	8,295	8,406	16	12	28	1.908	1.428	3.331
April . . .	8,518	8,535	14	18	32	1.640	2.109	3.749
May . . .	8,551	8,561	3	12	15	.350	1.402	1.752
June . . .	8,571	...	...	...	...	...	...	...
		233,195	662	371	1,033	2.839	1.591	4.430

TABLE II (continued).—N.C.O's and Men—Regulars &c.

Month # (1)	Strength of Force on 1st of Month (2)	Sum of Column (2) for months n and n+1 (3)	E (4)	Deaths during Month			Wounds (6)	Illness (9)	Total (10)
				Wounds (5)	Illness (6)	Total (7)			
October 11 to 31 1899	21,629	74,863	24,954	146	15	161	5,851	601	6,452
November	53,234	134,486	67,243	215	40	255	3,197	555	3,792
December	81,252	181,363	90,681	426	86	512	4,693	948	5,646
January 1900	100,111	224,127	112,064	417	280	697	3,721	2,499	6,220
February	124,016	274,600	137,300	688	375	1,063	5,011	2,731	7,742
March	150,584	322,458	161,229	238	623	861	1,476	3,864	5,340
April	171,874	348,927	174,463	105	823	928	1,602	4,717	5,319
May	177,063	357,140	178,570	201	1,201	1,402	1,126	6726	7,852
June	180,087	364,688	182,344	145	937	1,082	795	5,139	5,984
July	184,601	364,068	182,084	151	514	665	830	2,824	8,654
August	179,467	355,757	177,878	110	286	346	618	1,327	1,945
September	176,290	355,518	176,769	63	173	226	300	979	1,279
October	177,228	352,408	176,204	126	195	321	715	1,107	1,822
November	175,180	348,184	174,092	99	287	386	569	1,649	2,218
December	173,004	341,886	170,948	193	439	632	1,129	2,563	3,697
January 1901	168,882	337,488	168,744	114	530	644	676	3,141	3,817
February	168,606	337,055	168,527	103	508	611	611	3,014	3,625
March	168,449	342,640	171,320	74	359	483	432	2,095	5,527
April	174,191	342,357	171,179	67	321	388	391	1,875	2,266
May	168,166	331,663	165,832	106	426	532	639	2,569	3,208
June	163,497	327,653	163,827	86	261	347	525	1,583	2,118
July	164,156	322,167	161,033	82	150	232	509	981	1,440
August	158,011	316,695	158,348	72	115	187	455	726	1,181
September	158,684	315,628	157,814	175	105	280	1,109	665	1,774
October	156,944	311,302	155,651	118	135	263	758	867	1,625
November	154,358	309,847	154,924	64	282	296	413	1,498	1,911
December	155,459	319,620	159,810	96	350	446	601	2,190	2,791
January 1902	164,131	330,161	165,080	64	409	473	388	2,478	2,866
February	166,030	333,942	166,971	120	377	497	719	2,253	2,977
March	167,912	336,392	168,196	68	313	381	404	1,861	2,265
April	168,480	337,399	168,700	63	257	320	373	1,523	1,896
May	168,919	335,121	167,561	26	245	271	165	1,462	1,617
June	166,202	...	...	...	...	...	...	...	...
	...	...	4,980,325	4,811	11,317	16,128	966	2,272	3,238

TABLE II (continued).—*N.C.O's and Men—Imperial Yeomanry.*

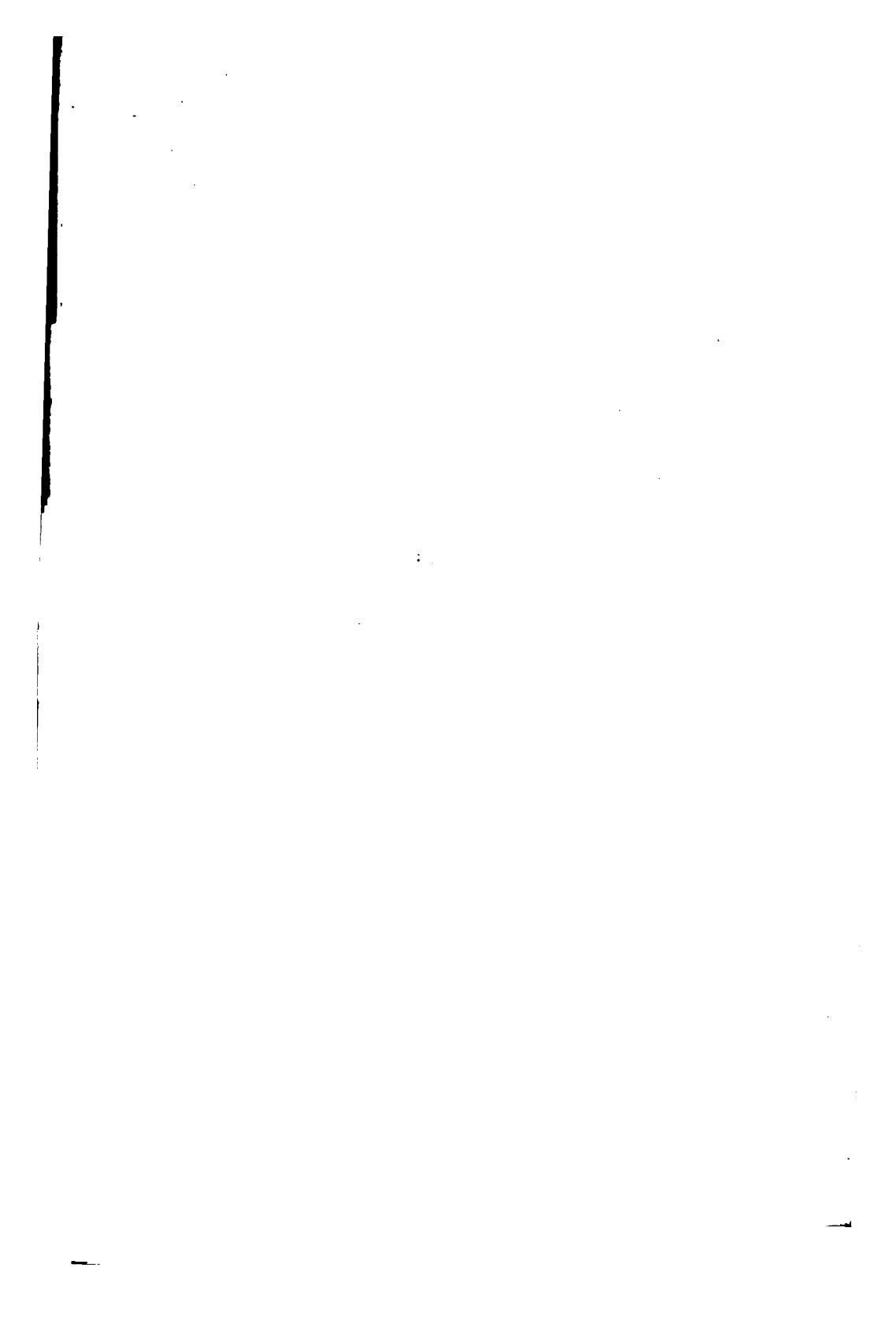
Month n (1)	Strength of Force on 1st of Month (2)	Sum of Column (2) for months n and n+1 (3)	E (4)	DEATHS DURING MONTH			MONTHLY DEATH-RATE PER 1,000		
				Wounds (5)	Illness (6)	Total (7)	Wounds (8)	Illness (9)	Total (10)
October 11 to 31 1899	...	...	...	...	...	...	...	...	...
November . . . . .	...	...	...	...	...	...	...	...	...
January	1,426	6,432	3,216	...	5	5	...	...	1,555
February	5,006	12,792	6,396	1	8	9	156	1,251	1,407
March	7,786	17,901	8,951	2	17	19	223	1,899	2,122
April	10,115	20,287	10,119	62	35	87	5139	3,459	8,598
May	10,122	20,297	10,149	25	43	68	2,463	4,237	6,700
June	10,175	20,300	10,150	17	36	53	1,075	3,547	5,222
July	10,125	20,221	10,111	11	18	29	1,088	1,780	2,868
August	10,096	19,566	9,783	10	18	28	1,022	1,840	2,862
September	9,470	18,497	9,249	14	22	36	1,514	2,379	3,893
October	9,027	17,918	8,959	12	25	37	1,339	2,790	4,129
November	8,891	16,915	8,458	20	54	74	2,365	6,384	8,749
December	1901	8,024	15,906	7,953	18	47	65	2,263	5,910
January	8,882	18,447	9,224	15	30	45	1,626	3,252	4,878
February	10,565	32,547	16,274	12	29	41	737	1,782	2,519
March	21,982	45,358	22,679	9	41	50	397	1,808	2,206
April	23,376	43,725	21,863	43	65	108	1,967	2,973	4,940
May	20,349	38,952	19,476	27	75	102	1,386	3,851	5,237
June	18,603	36,558	18,279	22	30	52	1,204	1,641	2,845
July	17,955	35,285	17,643	27	20	47	1,530	1,134	2,664
August	17,330	34,292	17,146	41	18	59	2,391	1,050	3,441
September	16,962	33,087	16,544	38	22	60	2,297	1,330	3,627
October	16,125	31,883	16,942	14	28	42	878	1,756	2,634
November	15,758	30,907	15,454	82	60	142	5,306	3,882	9,188
December	15,149	29,319	14,660	22	89	111	1,501	6,071	7,572
January	14,170	28,542	14,271	52	106	158	3,644	7,428	11,072
February	14,372	28,092	14,046	27	62	89	1,922	4,414	6,336
March	13,720	28,493	14,247	17	23	40	1,193	1,614	2,807
April	14,773	33,890	16,945	7	16	23	413	944	1,357
May	19,117	...	...	...	...	...	...	...	...
June . . . . .	...	...	368,187	637	1,042	1,679	1,730	2,830	4,560

TABLE II (continued).—N.C.O.'s and Men—Colonials.

Month n (1)	Strength on 1st of Month (2)	Sum of Column (2) for months n and n+1 (3)	E (4)	DEATHS DURING MONTH			MONTHLY DEATH-RATE PER 1,000		
				Wounds (5)	Illness (6)	Total (7)	Wounds (8)	Illness (9)	Total (10)
December 1899	14,681	32,599	16,299	58	13	71	3,559	.798	4,357
January 1900	17,968	39,799	19,900	17	17	34	.854	.854	1,708
February	21,381	46,796	23,398	77	22	99	3,291	.940	4,231
March	24,965	50,768	25,384	40	45	85	1,576	1,773	3,349
April	26,903	55,826	27,763	53	77	130	1,909	2,773	4,682
May	28,723	61,816	30,908	42	84	126	1,359	2,718	4,077
June	32,093	66,326	33,163	29	101	130	.874	3,045	3,920
July	34,283	75,556	37,778	49	58	102	1,297	1,403	2,700
August	41,323	82,287	41,143	51	25	76	1,240	.608	1,848
September	40,964	81,278	40,639	39	26	65	.960	.640	1,600
October	40,314	80,628	40,314	54	31	85	1,339	.769	2,108
November	40,314	77,952	38,976	45	44	89	1,155	1,129	2,284
December 1901	37,638	66,661	33,331	43	44	87	1,290	1,320	2,610
January	29,923	57,226	28,613	62	87	149	2,167	3,041	5,208
February	28,208	78,954	39,477	40	53	93	1,013	1,343	2,356
March	50,751	103,280	51,640	47	68	115	.910	1,317	2,227
April	52,529	106,240	53,120	43	55	98	.808	1,035	1,844
May	53,711	106,295	53,147	55	74	129	1,035	1,392	2,427
June	52,584	104,450	52,225	82	70	152	1,570	1,340	2,910
July	51,966	103,220	51,610	53	39	92	1,027	.756	1,783
August	51,354	102,025	51,018	31	48	79	.608	.941	1,549
September	50,571	100,423	50,211	59	87	96	1,176	.737	1,912
October	49,752	99,097	49,549	80	42	122	1,615	.848	2,463
November	49,346	98,614	49,307	34	59	93	.690	1,197	1,887
December 1902	49,269	96,575	48,287	27	86	118	.559	1,781	2,340
January	47,306	91,894	45,947	52	83	135	1,182	1,806	2,938
February	44,568	89,706	44,853	58	103	161	1,293	2,296	3,589
March	45,118	91,854	45,927	73	66	139	1,589	1,487	3,026
April	46,736	93,073	46,537	22	57	74	1,117	1,590	2,166
May	46,387	90,050	45,025	9	48	57	.200	1,068	1,266
June	43,713	...	...	...	...	...	...	...	...
		...	1,215,484	1,424	1,652	3,076	1,172	1,359	2,531

TABLE II (continued).—*N.C.O's and Men—All Classes Combined.*

Month n	Strength of Force on 1st of Month	E	DEATHS DURING MONTH			MONTHLY DEATH-RATE PER 1,000		
			Wounds (4)	Illness (5)	Total (6)	Wounds (7)	Illness (8)	Total (9)
October 11 to 31 1899	21,629	24,954	146	15	161	5,851	.501	6,452
November	53,234	67,243	215	40	255	3,197	.595	3,732
December	95,883	106,980	484	98	583	4,524	.525	5,449
January	118,079	131,964	434	297	731	3,289	.289	5,389
February	147,273	163,914	765	402	1,167	4,667	.463	7,120
March	180,555	193,009	279	676	955	1,446	.3502	4,948
April	215,463	211,177	160	917	1,077	.758	.4342	5,100
May	216,891	219,597	295	1,320	1,615	1,343	.611	7,354
June	222,302	225,656	199	1,081	1,280	.882	.4790	5,672
July	229,009	229,962	217	603	820	.944	.2622	3,566
August	230,915	229,132	172	279	451	.750	.1218	1,968
September	227,350	227,181	102	217	319	.449	.955	1,404
October	237,012	225,767	194	243	442	.859	.1088	1,957
November	224,521	222,027	156	356	512	.702	.1603	2,905
December	219,533	212,732	256	637	793	1,203	.2524	3,277
January 1901	205,929	205,310	194	664	858	.945	.3284	4,179
February	204,691	217,228	158	591	749	.727	.2721	3,448
March	229,165	239,234	138	456	589	.556	.1906	2,962
April	248,702	246,978	119	417	536	.482	.1688	2,170
May	245,553	240,842	204	565	769	.847	.2345	3,192
June	236,430	235,528	195	406	601	.828	.1724	2,962
July	234,625	230,972	157	219	376	.680	.948	1,628
August	227,320	227,004	130	183	313	.573	.1906	1,379
September	226,635	225,171	275	160	435	1,221	.711	1,982
October	223,658	221,744	296	199	435	1,064	.887	1,961
November	219,828	220,173	112	319	431	.508	.1449	1,957
December	220,516	223,551	205	496	701	.917	.2119	3,136
January 1902	226,586	225,687	138	681	719	.611	.2574	3,185
February	224,788	226,095	230	586	816	1,017	.2582	3,609
March	227,402	228,169	168	441	609	.786	.1938	2,969
April	228,936	229,484	102	382	434	.444	.1447	1,891
May	230,029	229,531	42	309	351	.183	.1846	1,529
June	229,032	...	...	...	...	...	...	...
	...	6,563,996	6,872	14,011	20,983	1,047	2,135	8,182



Scale 3 spaces to each unit of 1,000 q.

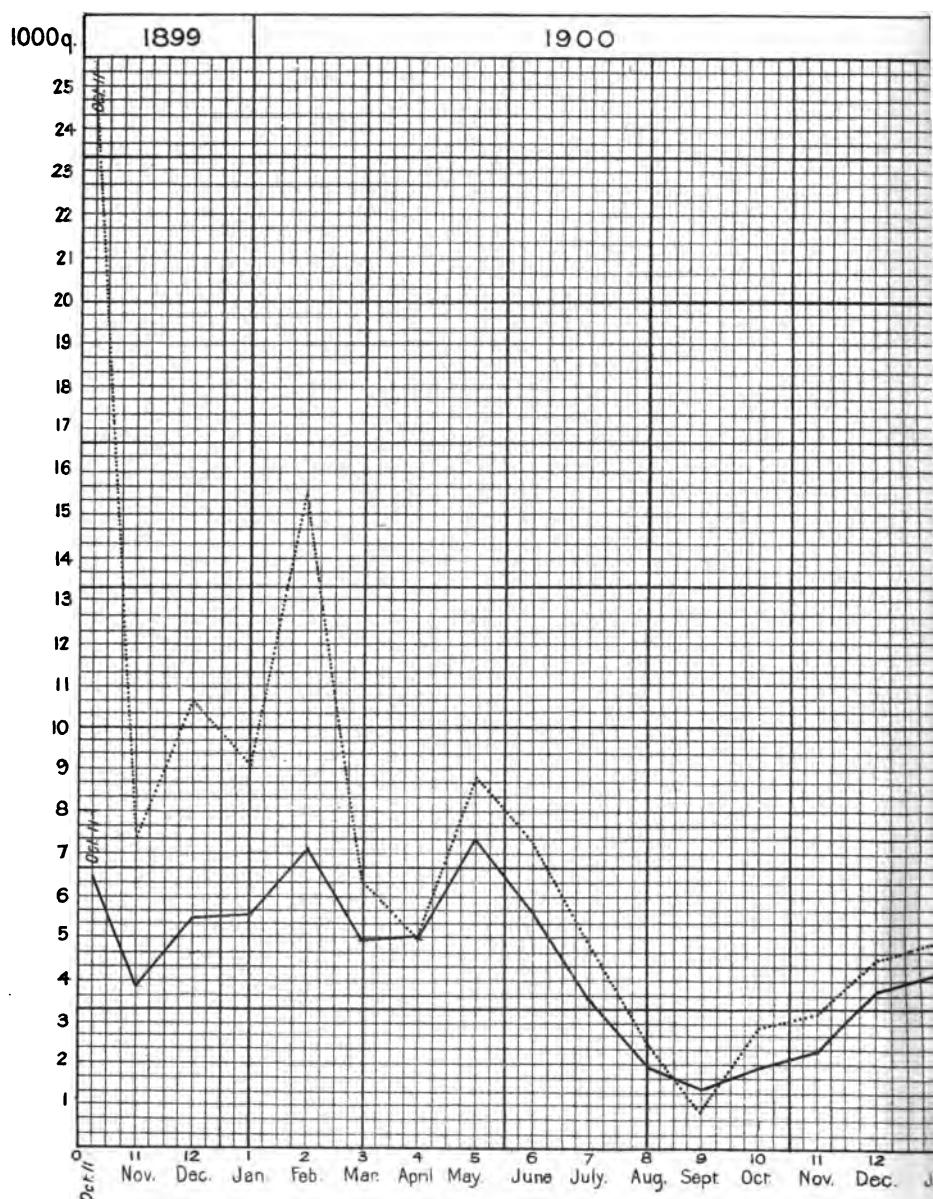
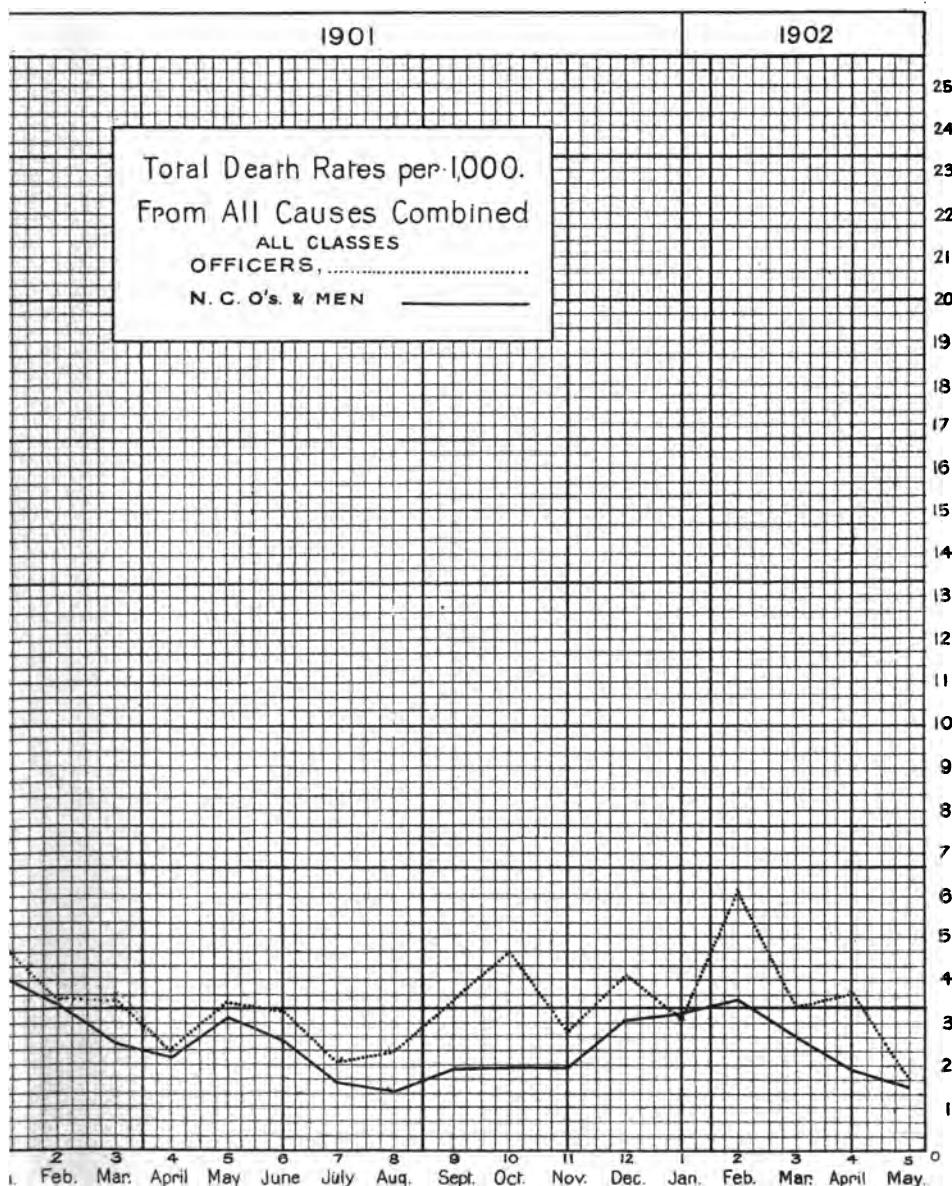
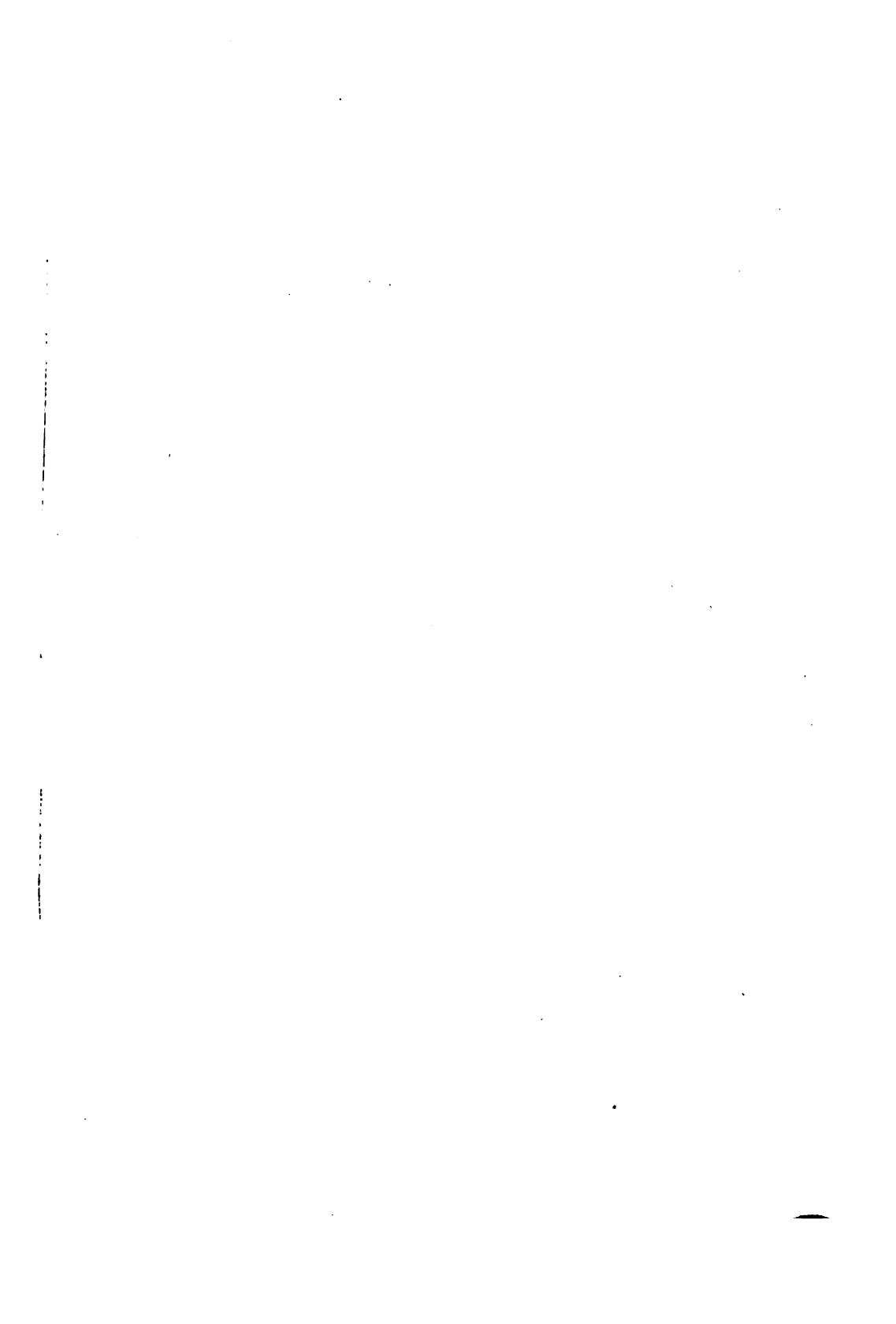


Diagram A.







Scale - 3 Spaces to each unit of 1000q

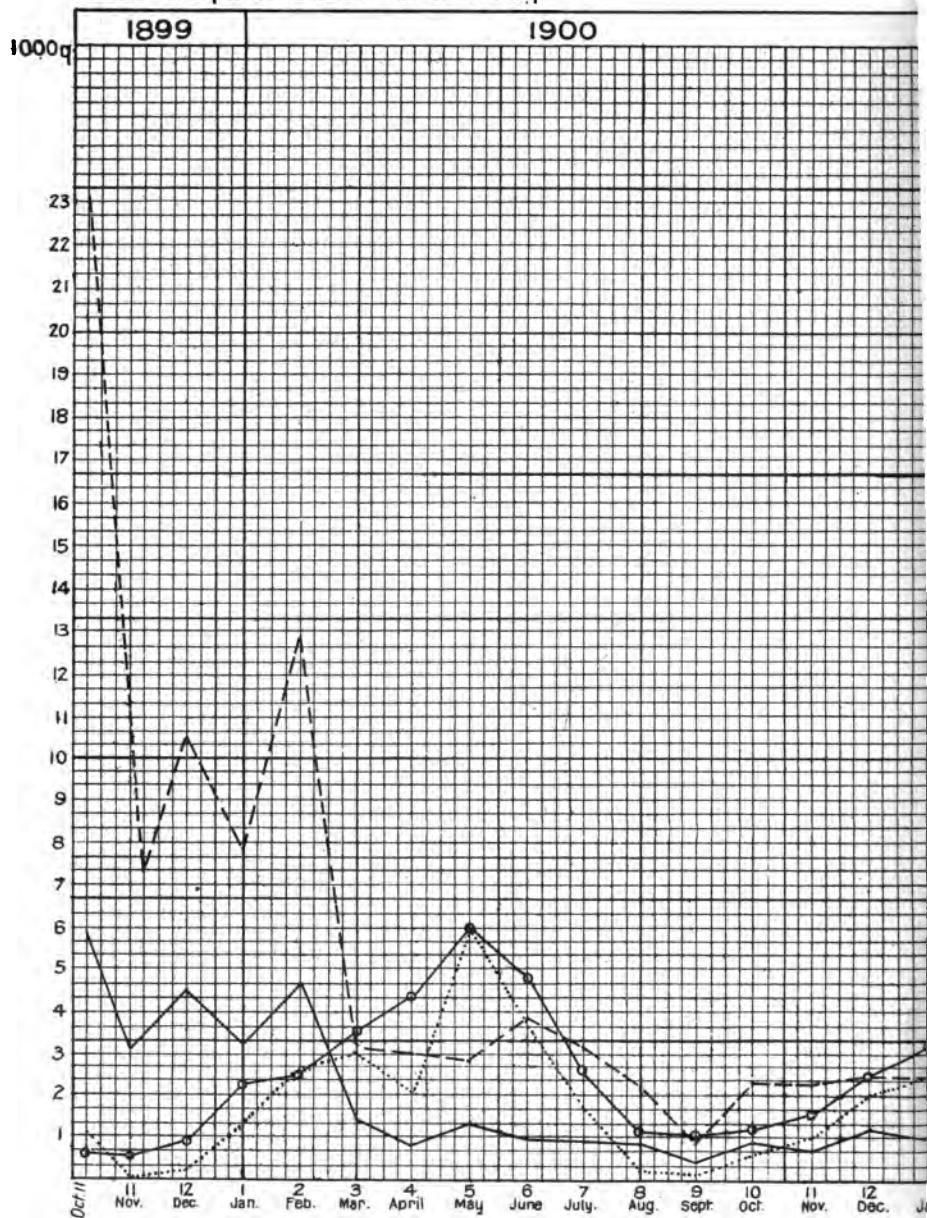
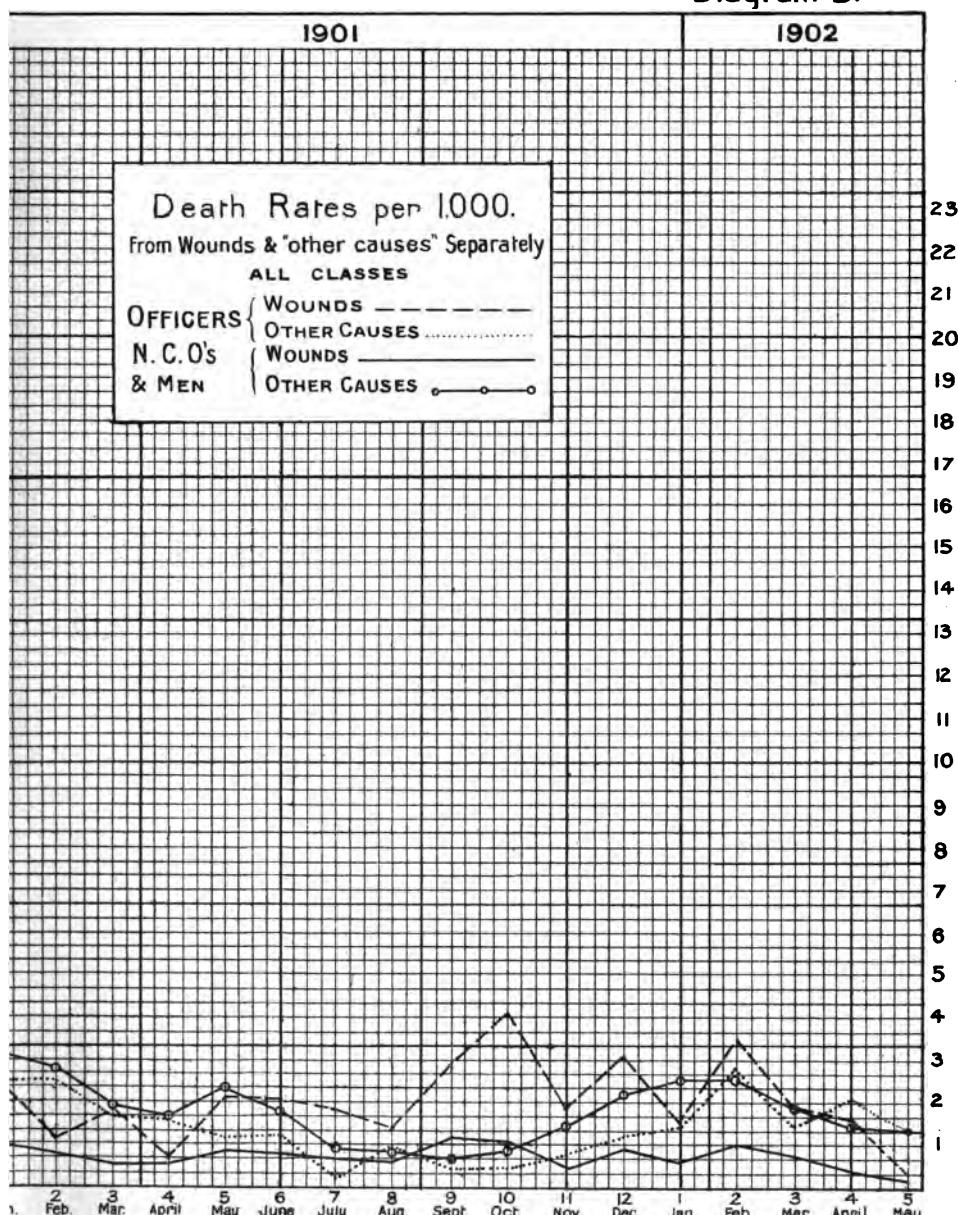
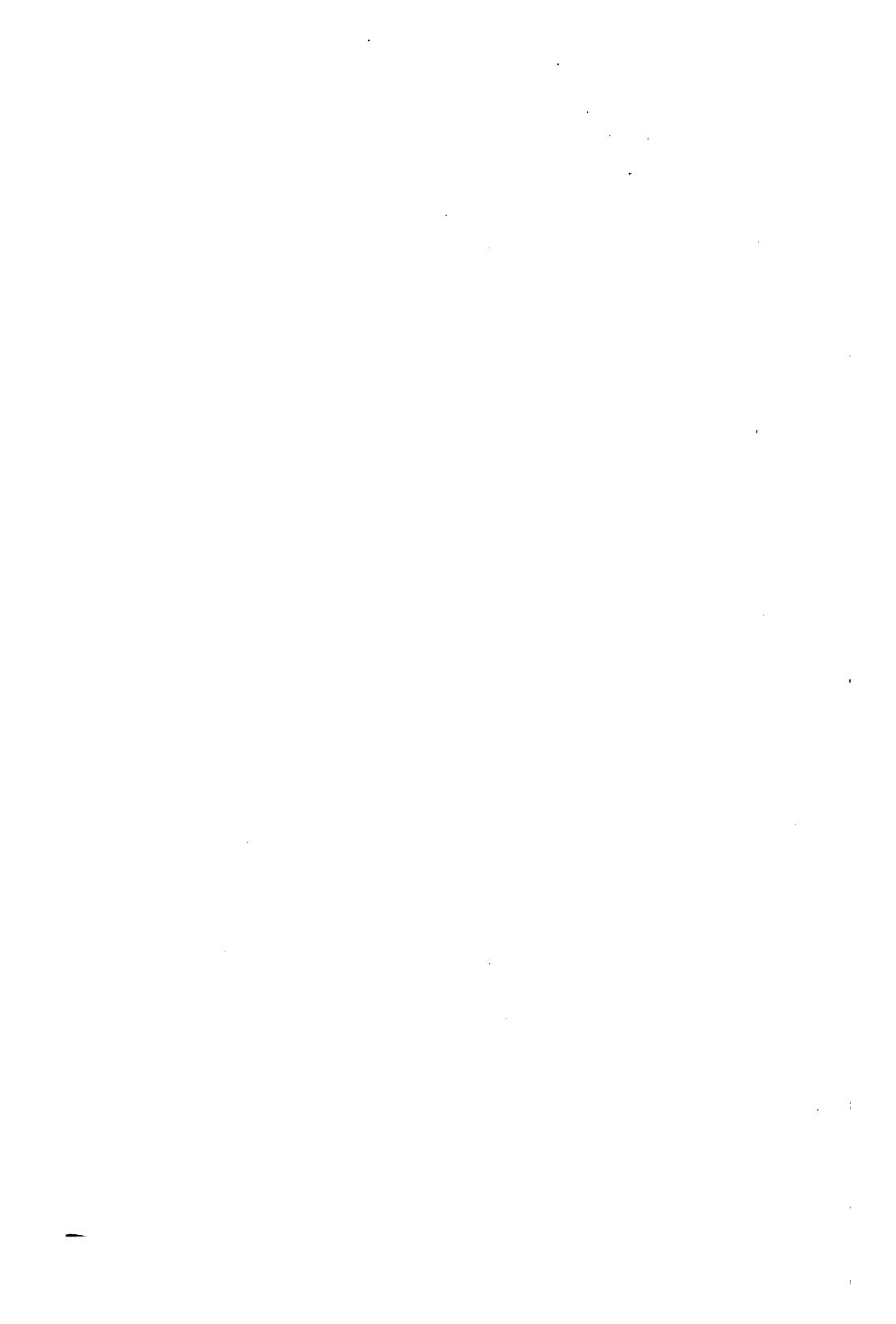


Diagram B.



11
10
9
8
7
6
5
4
3
2
1
0



In Table II the second column shows the "Strength of Forces", taken from Schedules A and B, for officers and men respectively, further sub-dividing each of these into (1) Regulars, &c.; (2) Imperial Yeomanry; and (3) Colonials.

Column 3 gives the sum of every two consecutive values of column 2, combining months n and $n+1$. Column 4 is one-half of column 3 (except for October 1899), being the arithmetic mean between the numbers exposed on the first of any one month, and on the first of the succeeding month. This gives E, the number of months' exposure during the period. The strength of forces on 11 October 1899 was obtained from the Parliamentary returns, but no reliable information could be obtained as to the strength of the Colonial forces engaged prior to December 1899, so that no rates of mortality could be given for them for the months of October and November, and the corresponding deaths are accordingly omitted. The deaths are reproduced from Table I in columns 5, 6 and 7; and in columns 8, 9 and 10, are shown the resulting death-rates per month per 1,000 exposed to risk, divided into rates from wounds, rates from other causes, and total rates. They are obtained by dividing columns 5, 6 and 7, by the corresponding figures in column 4, and multiplying the result by 1,000. It has been thought advisable, throughout the paper, to follow the practice of the Registrar-General in his weekly returns by giving the death-rates per 1,000, as thereby we are better able to appreciate the significance of the figures, which would be almost entirely in decimals were a percentage method adopted.

For the purpose of seeing how the various phases of the war affected the mortality, we append a concise epitome of the chief events—events likely to increase the death-rate from disease being distinguished from those likely to increase the death-rate from wounds. As an example of the use that may be made of this epitome, we might point out that deaths from disease were most prevalent when the army rested after Paardeberg, owing, as is stated in the Report of the Hospitals Commission, to the bad water drunk by the troops, and also to the scarcity of food and medical stores occasioned by the difficulties of transport in keeping up with the previous rapid movements of the forces at this period of the war; a point referred to more in detail further on.

South African War 1899-1902—Epitome of Chief Events.

Month	Events affecting rate of Mortality from Wounds	Events bearing upon rate of Mortality from Disease
1899		
Oct.	Invasion of Natal. Retreat of British to Ladysmith. Battles of Dundee, Elandslaagte, and Nicholson's Nek. Investment of Kimberley and Mafeking	
Nov.	British advance on Kimberley. Battles of Belmont, Enslin, and Modder River	Nov. 1 — Ladysmith invested.
Dec.	Further advance to relieve Kimberley. Battle of Magersfontein. Attempt to relieve Ladysmith. Battle of Colenso.	Ladysmith invested.
1900		
Jan.	Battle of Stormberg Boer assault on Ladysmith. Battle of Spion Kop	Ladysmith invested.
Feb.	Battle of Vaal Krantz. Heavy fighting at Pieter's Hill and relief of Ladysmith. Relief of Kimberley. Battle of Paardeberg	Feb. 28 — Ladysmith relieved. Halt at Paardeberg 16-27 Feb. Forced march to Bloemfontein.
March	Bloemfontein occupied. Battle of Sanna's Post	Mar. 13—Army halts at Bloemfontein. Insufficient food during part of the time. Waterworks cut off at Bloemfontein.
April	Battle of Reddersberg	12-22 May, halt at Kroonstad.
May	Advance on Pretoria resumed. Lines of communication attacked. Fighting at Lindley	
June	Pretoria occupied. Continuous guerilla fighting, and Battle of Roodeval	
July	Further guerilla fighting. Operations along Delagoa Bay Railway. Surrender of General Prinsloo	
Aug.	Battle of Bergendal, and final break-up of the organized Boer Army	
	From September 1900 to May 1902 there was continuous skirmishing with the guerilla forces of the enemy, the following being the more important engagements :	
Oct.	Frederickstad	
Nov.	Bothaville. Dewetsdorp	
Dec.	Nootgedacht. Helvetia	
1901		
Jan.	Determined attacks on British posts, Modderfontein	
March	Lichtenburg (Yeomanry engaged)	
May	Vlakfontein	
June	Wilmansrust (Victorians engaged). Reitz	
Sept.	De Jager's Drift. Eland's River Poort. Fort Italia. Moedwill	
Oct.	Zeerust (Yeomanry engaged). Brakenlaagte	
Nov.	Villiersdorp	
Dec.	Tafelkop. Tweefontein	
1902		
Jan.	Lichtenburg	
Feb.	Calvinia. Klerksdorp	
March	Tweebosch	

The rates vary so considerably that their general significance is lost in the tabulated form of Table II, and to overcome this difficulty they have been put into geometric form in diagrams A and B.

In these diagrams the base line represents the various calendar months of the war, commencing with 11 October 1899. The ordinates marked $1,000q$ represent the monthly death-rates obtained in Table II. In order to show the effect more clearly, the scale for the N.C.O's and men has been taken as four times that of the commissioned officers. It was not possible to adopt a larger scale for the latter, owing to the heavy death-rate from wounds experienced by them as compared with the N.C.O's and men, particularly in the early stages of the war. In the first diagram also, it was found necessary to adopt the same scale as that used for the commissioned officers. As the scale is inserted on each diagram, it is hoped that no difficulty may be experienced from the use of this dual basis.

No attempt whatever has been made, either in these diagrams or in any other part of the paper, to smooth the angularities by any method of graduation. The death-rates we are dealing with depended upon the ever-varying incidents of the campaign, and a single day's battle involving heavy loss, or the exposure to extreme hardships and want of food for a few days, immediately increased them out of all proportion to surrounding rates, which may possibly refer to a time of comparative peace and plenty. The graduation of such results would assume some form of a law of progression, would tone down the effects of the events of the war, and would thus minimize their significance.

The first diagram (A) contrasts the total mortality from all causes between commissioned officers and N.C.O's and men, in each case all branches of the Service being combined. It will be seen that the diagram shows very clearly that the officers experienced a considerably higher death-rate than the N.C.O's and men.

Diagram B carries the comparison a step further, by subdividing the causes of death into those from wounds, and those from other causes, and enables us better to follow the rates with respect to the various events of the war. Here we notice at once that the death-rates amongst the two classes under consideration vary in opposite directions. Taking the deaths from wounds, we observe that the commissioned officers invariably experienced a higher death-rate throughout the whole period of

the war, in most cases considerably higher, than the other classes of combatants. If, however, we take the deaths from other causes, we observe that almost invariably the rate for the N.C.O's and men is the higher. This fact, so clearly demonstrated by these diagrams, is a marked feature, not only of the recent war, but of war statistics generally, and has usually been attributed to the care taken by officers to avoid those prevalent evils of campaign life which breed disease and death.

These results fit in with general expectations, it being well known that officers were marked men on the battle field, while it is probable that as a body they were men of better stamina than the rank and file, and perhaps were the better cared for when ill.

We can read also, in this illustration, the general rough outline of the history of the war as affected by battle or by disease. It will be observed that, as a rule, the curves for officers and men respectively proceed in the same general direction. The ordinates, for instance, of the death-rates from wounds rise generally to a maximum or fall to a minimum in the same calendar month, and the same may be observed of the two curves relating to the death-rates from other causes. This tends to show that the same causes were operating upon both officers and men, and we may accordingly safely say that the predisposing causes must be looked for, as might naturally be expected, in the varying incidents of the campaign.

Referring to the "Epitome of Events" given on page 18, we are able very easily to follow in the diagram many of the chief events in their effect upon the death-rate. Thus from the beginning of January 1900 a steady rise is observable in the death-rate from wounds, reaching its maximum at the end of the month, and falling rapidly in February. It will at once be seen that the heavy fighting around Ladysmith and connected with its relief caused the rise referred to. The rate practically ceases to fall in March and April, and rises only slowly in May. A reference to the Epitome shows us that this was the period of the long halt at Bloemfontein, when there was comparatively little fighting. We are, however, unpleasantly reminded, upon looking at the curves for "Other Causes", that this period of comparative inactivity was not a period of immunity from death, for a sharp turn upwards occurs in March, reaching a maximum in May, and then slowly descending as the army marched forward

to Pretoria. The reason for this heavy rate has already been touched upon in referring to the fact that the rapid movement to Paardeberg made it impossible for transport to keep pace with the demands made upon it. It may be observed, moreover, that the disease contracted at that place only developed to its fullest extent during the halt at Bloemfontein, three weeks being generally considered by the medical profession as the period of incubation of enteric fever. To this may be added the effects of the engagement at Sanna's Post, resulting in the cutting off for a time of the water supply to Bloemfontein, which must have had a considerable effect upon the deaths from disease.

In reference to the subject of disease generally, we are informed by the Army Medical Department that "Enteric was rife among "the Boers around Kimberley before our army reached its "neighbourhood, and that Harrismith has always been regarded "as an enteric centre. Paardeberg is regarded as the source of "the Bloemfontein trouble—decaying animal and vegetable "matter in the stream there—and that we brought it from "Paardeberg to Bloemfontein. Wherever there has been lack of "water for sanitary purposes there has been trouble. Excess of "meat is also deemed a factor."

Another interesting point may be mentioned here. It will be seen that the death-rates from other causes uniformly tended to rise during December and January. This is the height of the South African summer, a season which is generally considered by the medical profession as productive of excessive mortality from enteric fever. It may also be noticed that there is a rise in the death-rates about the month of June both for 1900 and for 1901. Dr. J. W. Washbourn, in his presidential address to the British Medical Association, stated that "a chill, which in England would "probably give rise to an attack of nasal catarrh, in South Africa "would cause an intestinal catarrh"; and this may possibly be the explanation, as June is the period of mid-winter in South Africa.

These points, together with many others equally interesting, are brought out in the succeeding diagrams, in which the three branches of the forces are subdivided and compared. Curves giving the comparisons for officers were prepared, but as they followed very generally the same form as the rates for N.C.O's and men, they have not been introduced, but Diagrams C, D, and E, referring to the latter, are given here that we

may obtain a clearer idea of the facts brought out. In Diagram C, we have a general comparison of the death-rates from all causes for each of the three groups of the Imperial forces. The fourth curve, dealing with assured lives, will be dealt with later on.

The first point that strikes the eye as we look at the curves is that their general conformation is similar, the maxima and minima occurring always about the same period of time. This shows, perhaps, more clearly than anything else that the rates were affected entirely by the incidents of the war, and that we must look for their interpretation only in the light of those incidents.

The next noticeable point is that, almost from the moment of their arrival in South Africa, the Imperial Yeomanry rapidly took the first place in the casualty lists and, practically till the end of the war, held that place as an easy first. The reason for this is probably almost entirely due to their being mounted men; the war, from the time that they went out (February 1900), being largely of such a nature as to keep this arm of the Service continually employed in the most arduous duties, and calling them constantly to positions of danger in almost every action of importance.

It would have been interesting, had time allowed, and had statistics been available, to compare the death-rate of cavalry, as distinguished from the other branches of the Regulars, with the Yeomanry.

The Regulars, as was to be expected, suffered very severely in the early stages of the war. But as they learnt the lessons taught by the nature of the warfare they had to face, the rate seems very rapidly to have diminished, and thereafter to have fluctuated within much narrower limits, the minima being reached in September 1900 and August 1901. Generally speaking, these rates fall between those for the Imperial Yeomanry on the one side and the Colonials on the other.

In the latter part of the war, *i.e.*, from the middle of May 1901, it will be observed that the rates for the Regulars were the lowest. This may probably be accounted for by their having been employed to hold the lines of communication and to garrison the block-houses, while the Yeomanry and Colonials, being mounted men, were engaged more actively in the field.

Diagrams D and E enable us to analyze the mortality with more regard to its causes, the first diagram giving the death-rates from wounds only, and the second those from other causes.



Scale, 12 Spaces to each unit of 1000.q.

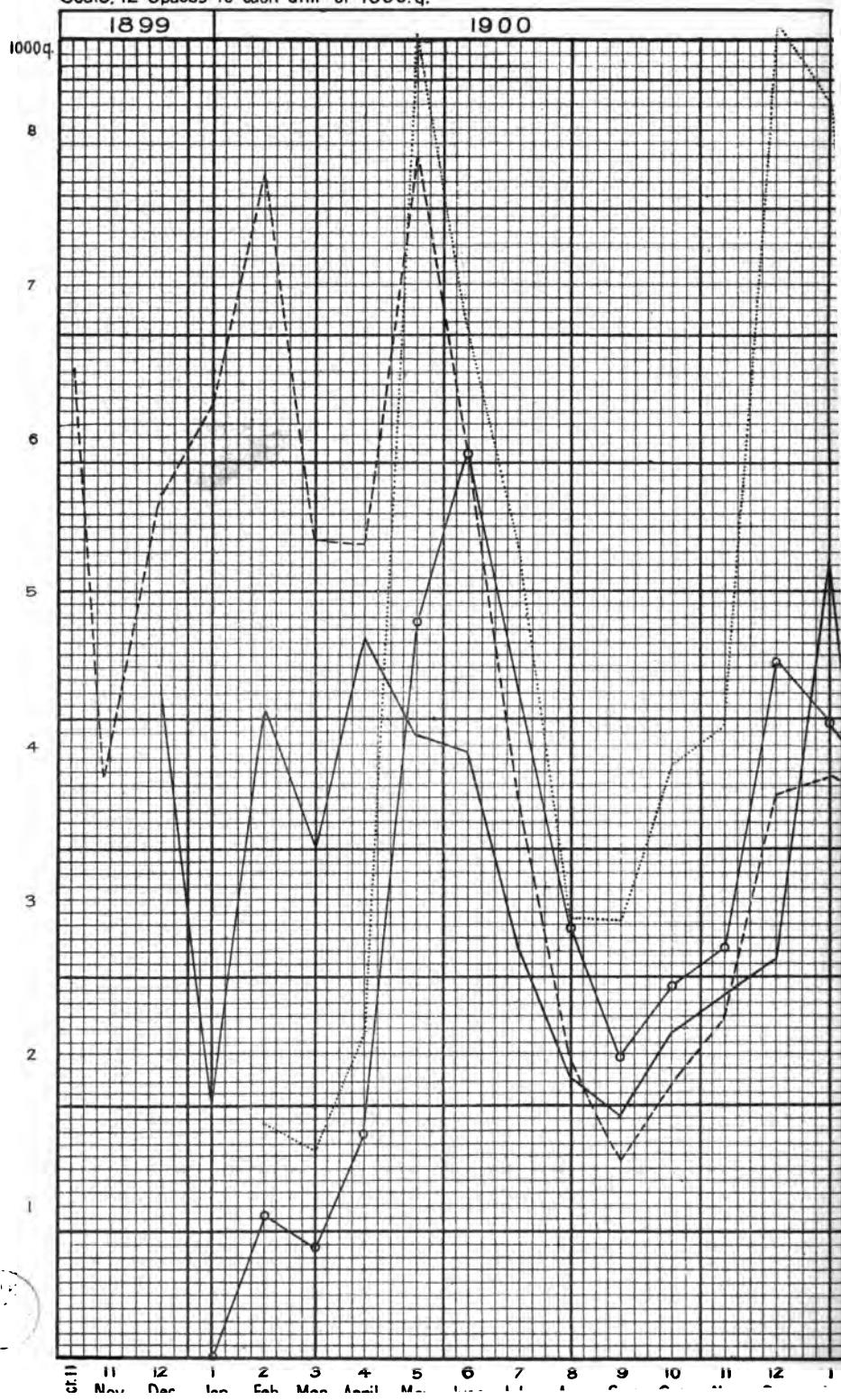


Diagram C.

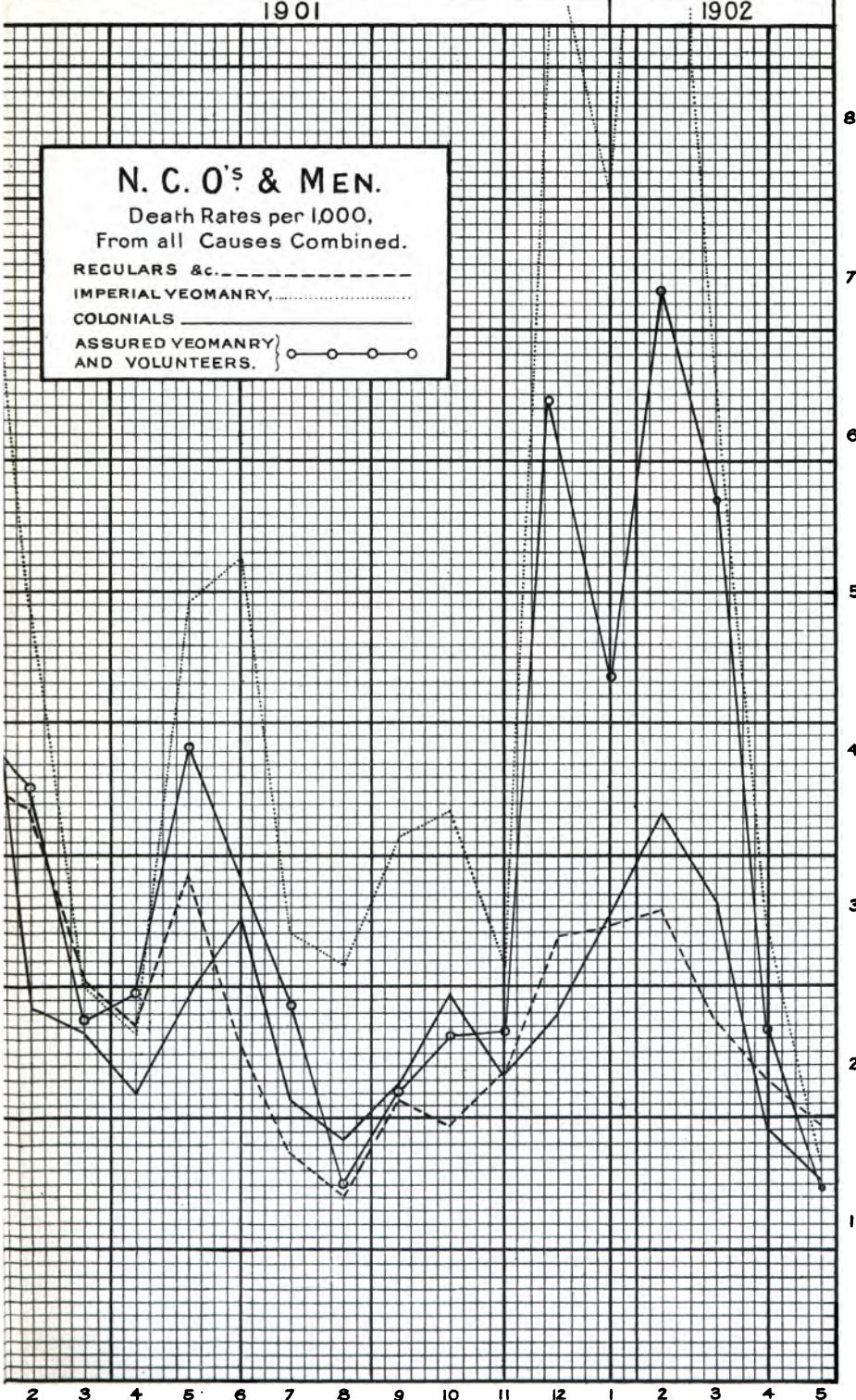
1901

1902

N. C. O's & MEN.

Death Rates per 1,000,
From all Causes Combined.

REGULARS &c. -----
 IMPERIAL YEOMANRY,
 COLONIALS
 ASSURED YEOMANRY
 AND VOLUNTEERS. {





Scale 12 spaces to each unit of 1000 q.

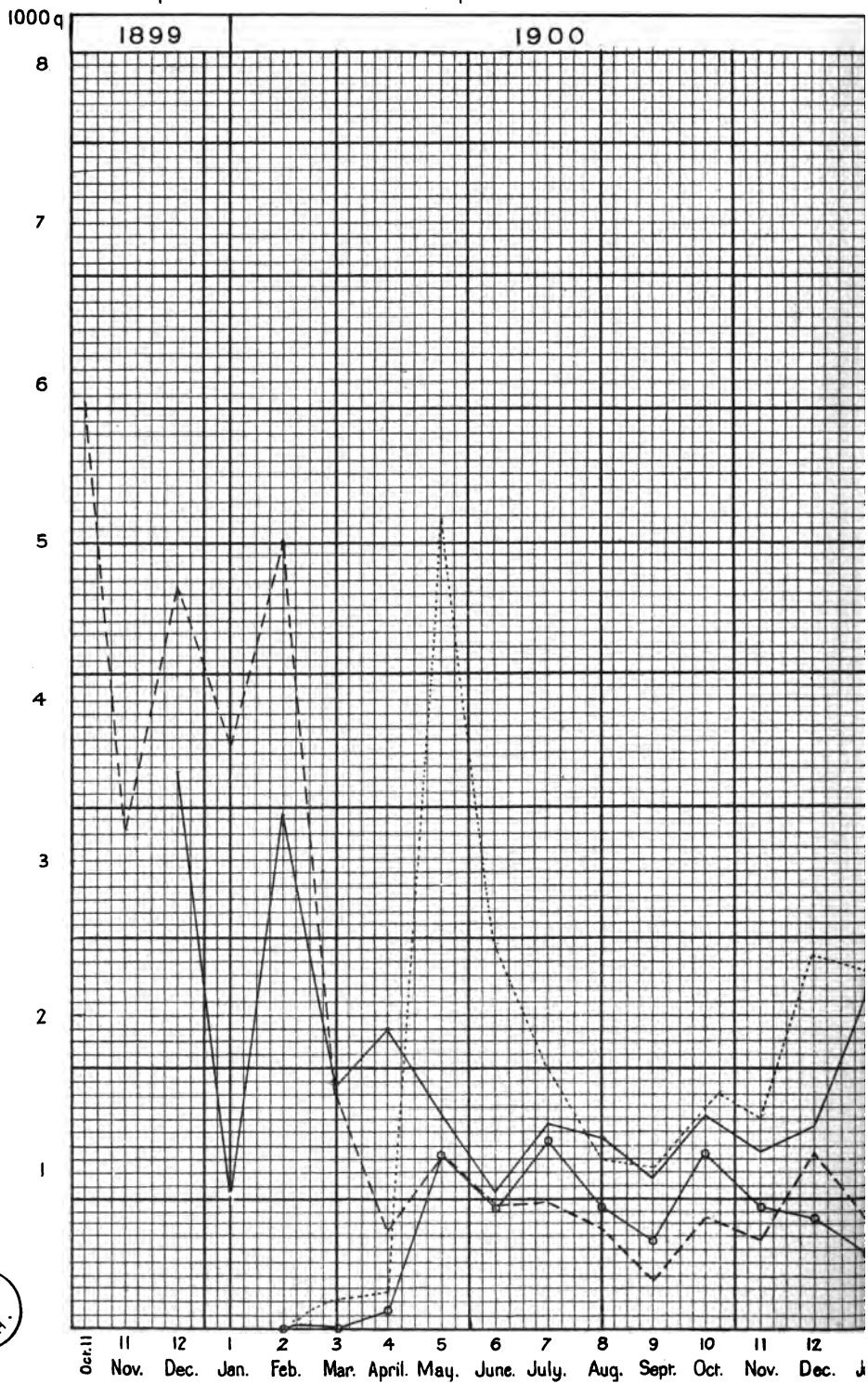
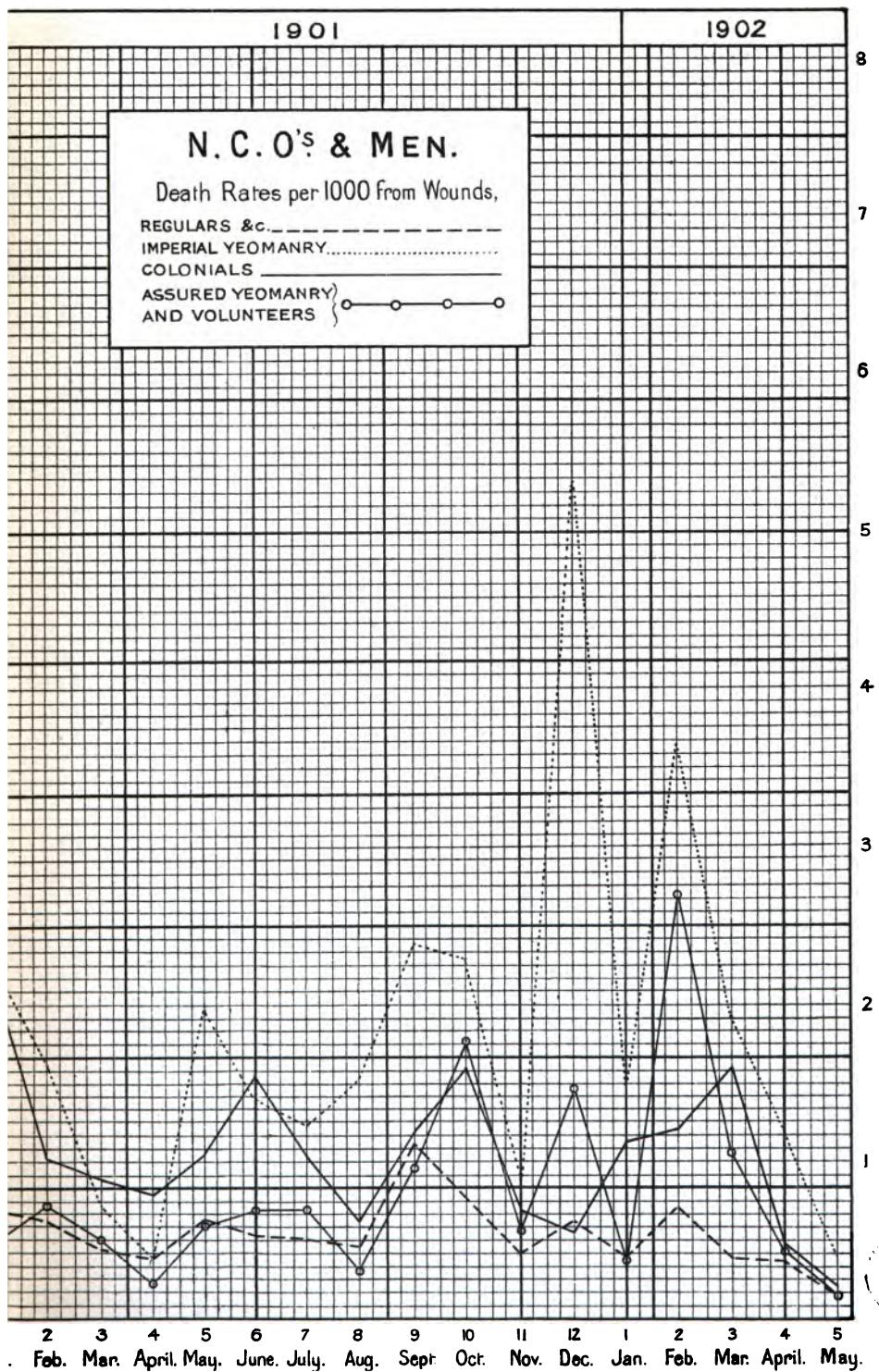
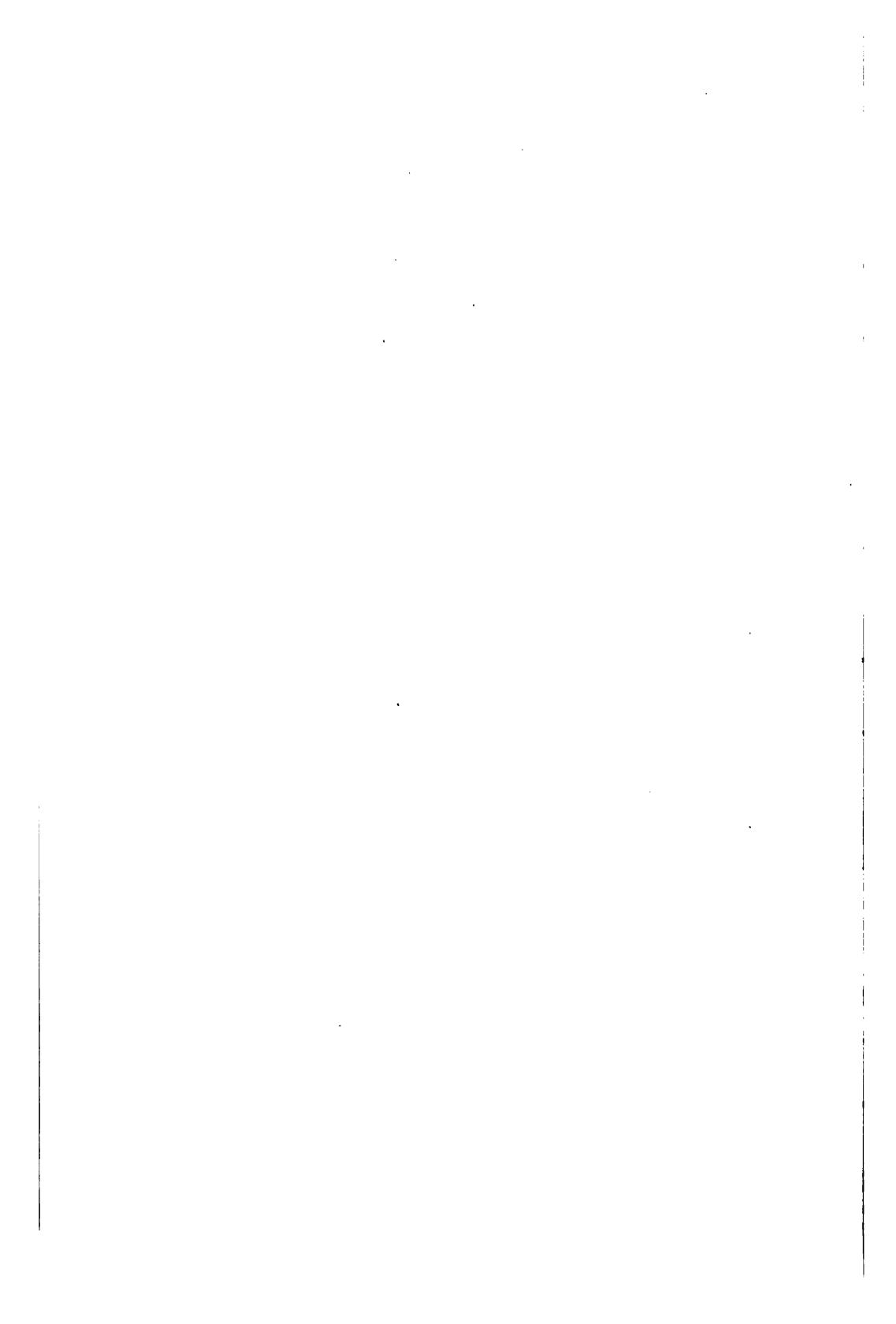
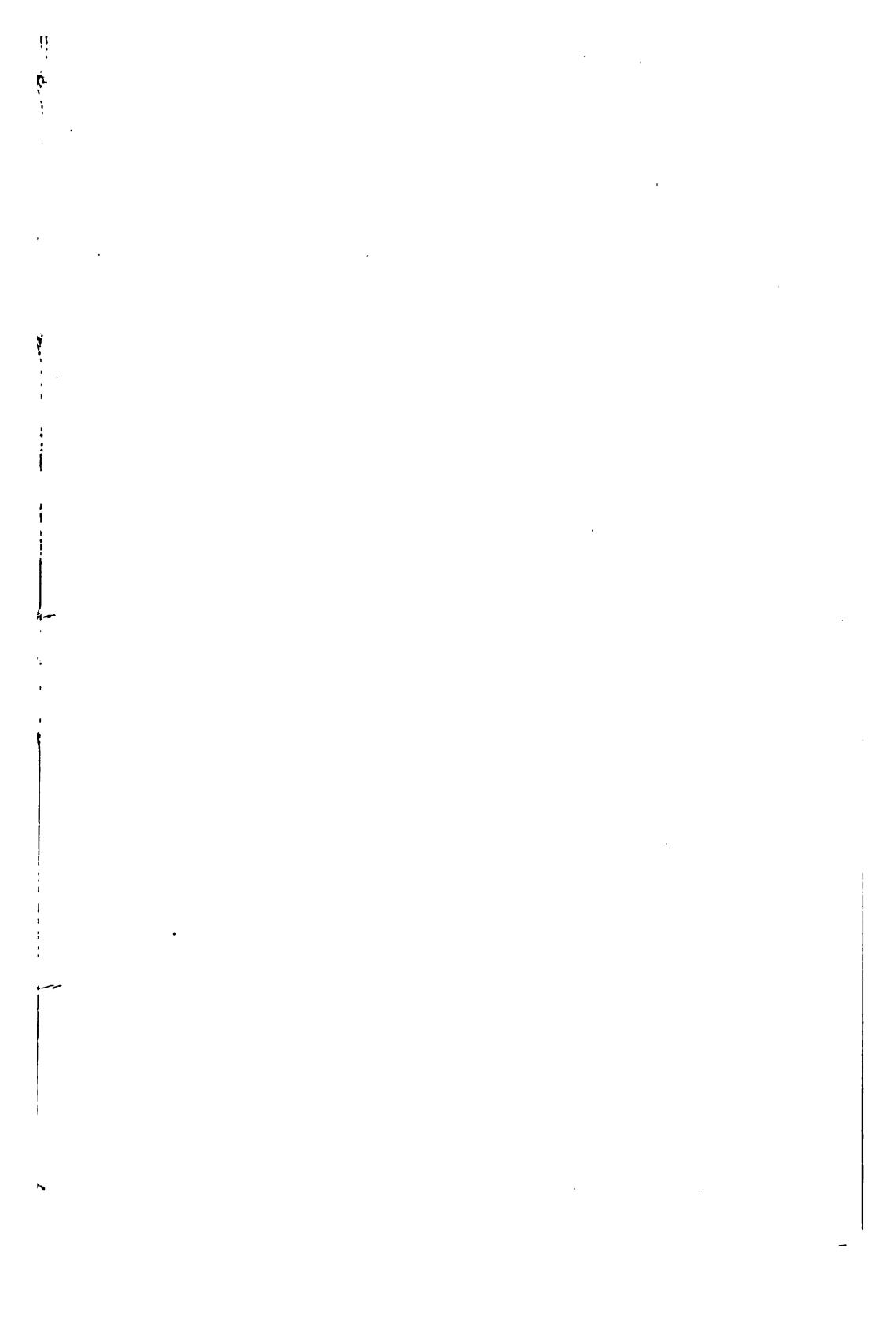


Diagram D.







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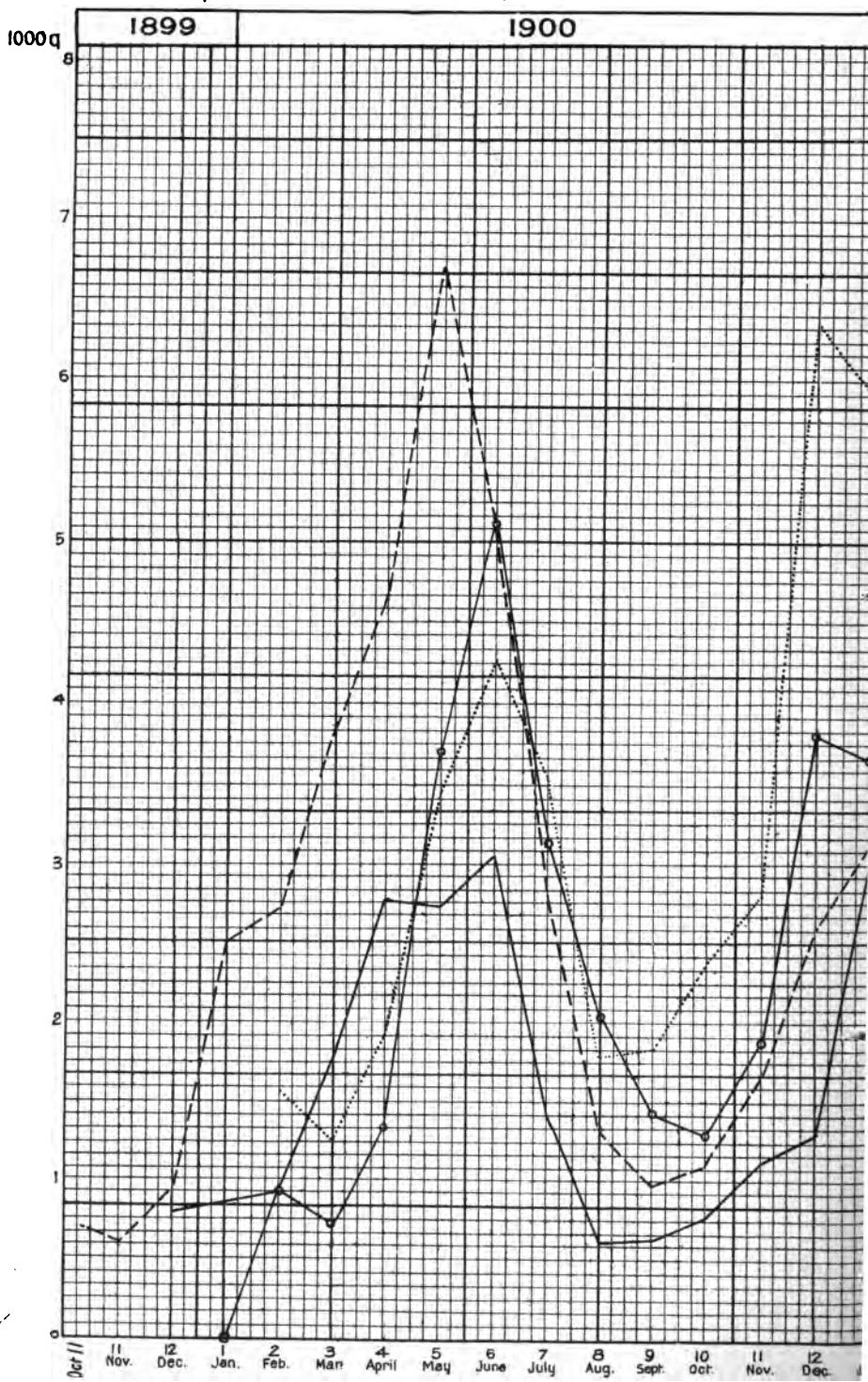
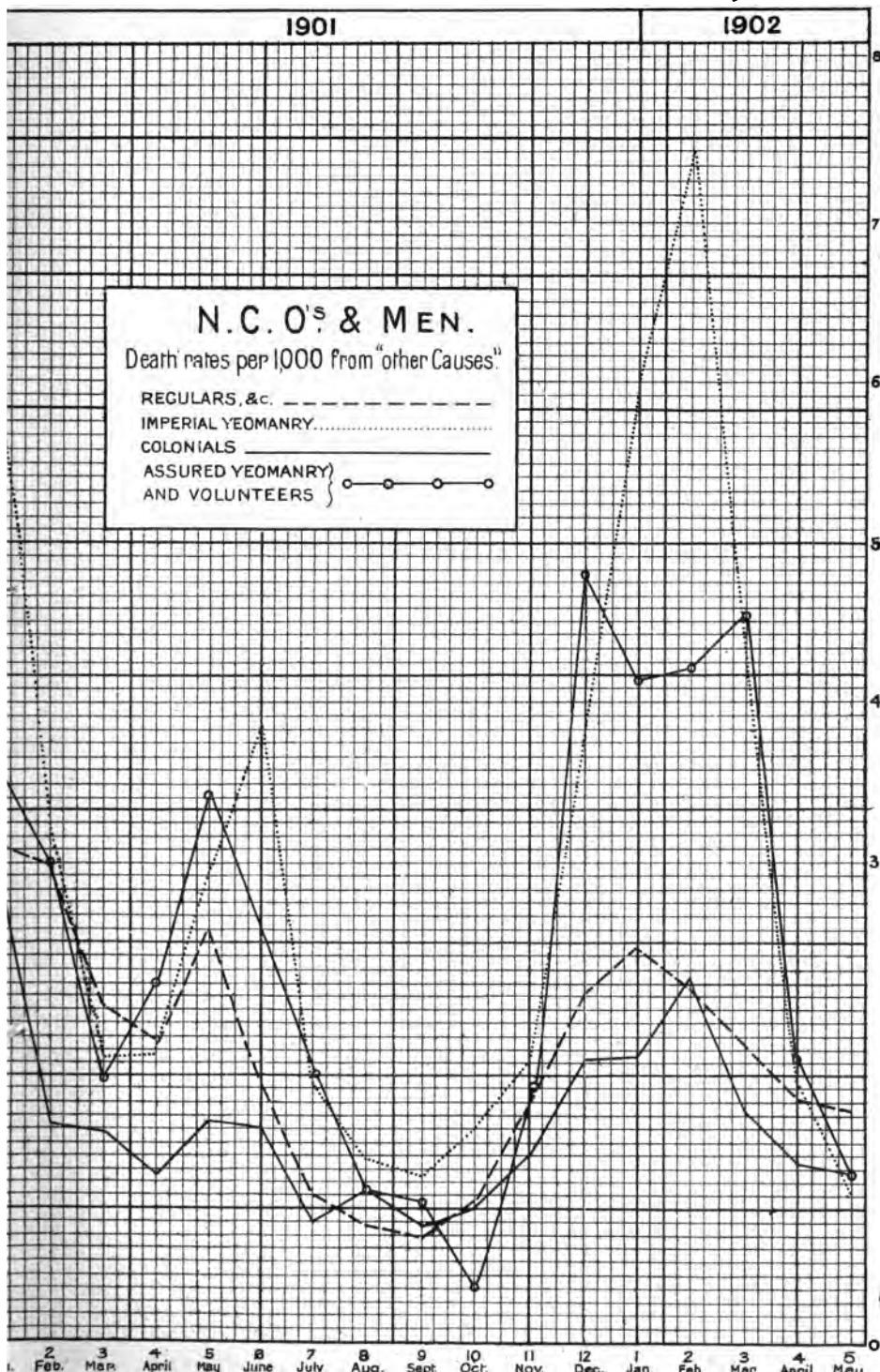
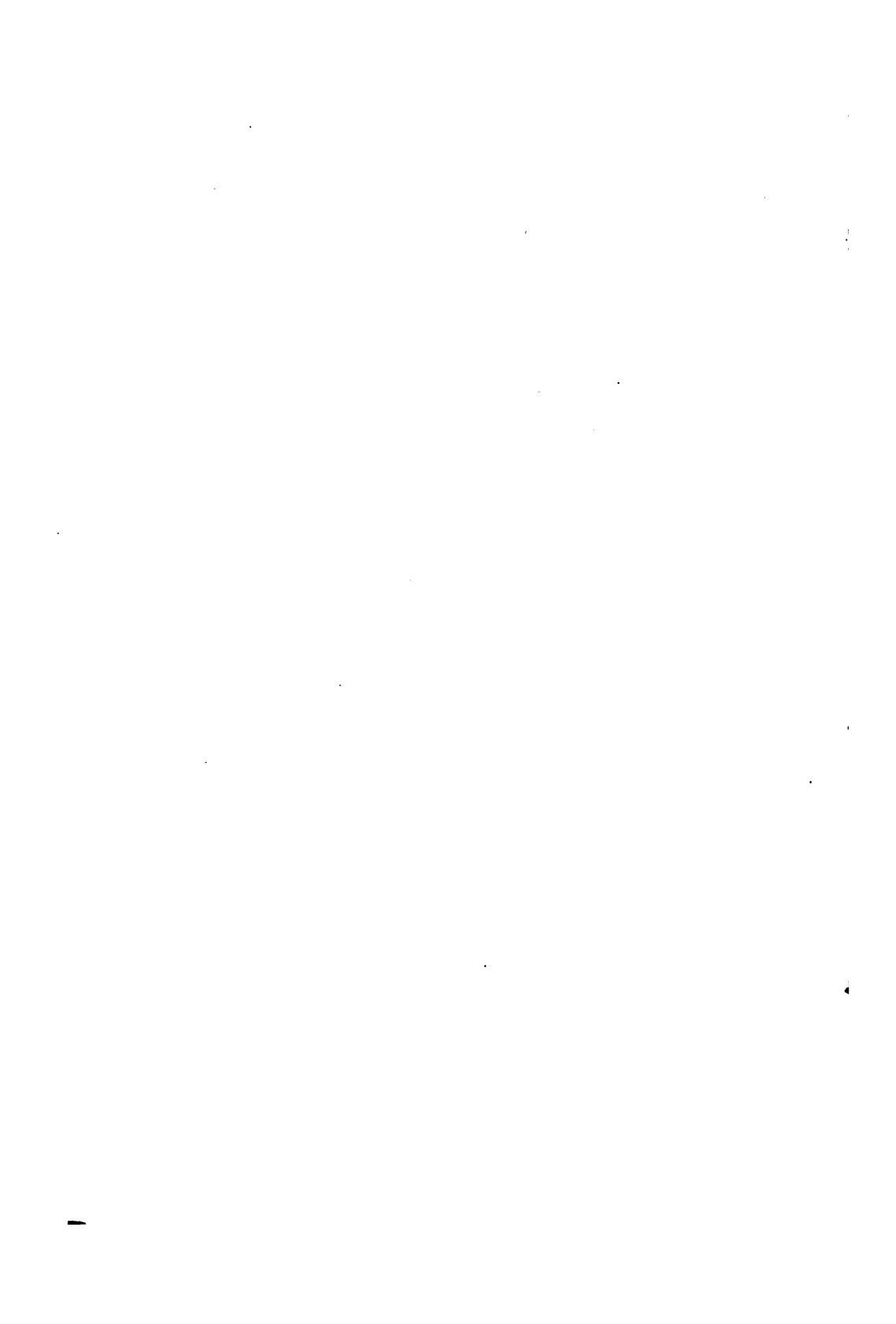
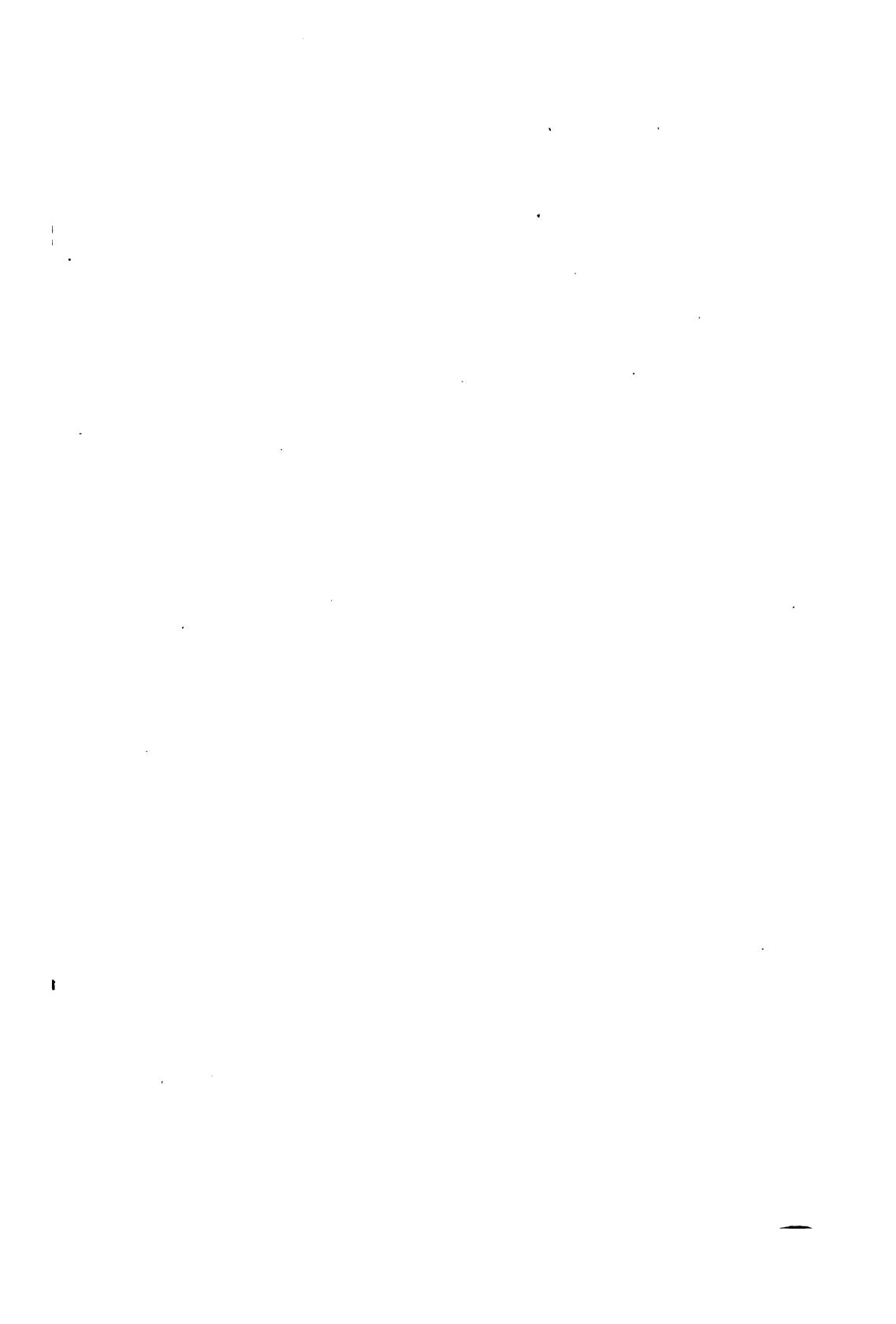


Diagram E.







Scale 12 spaces to each unit of 1000 q.

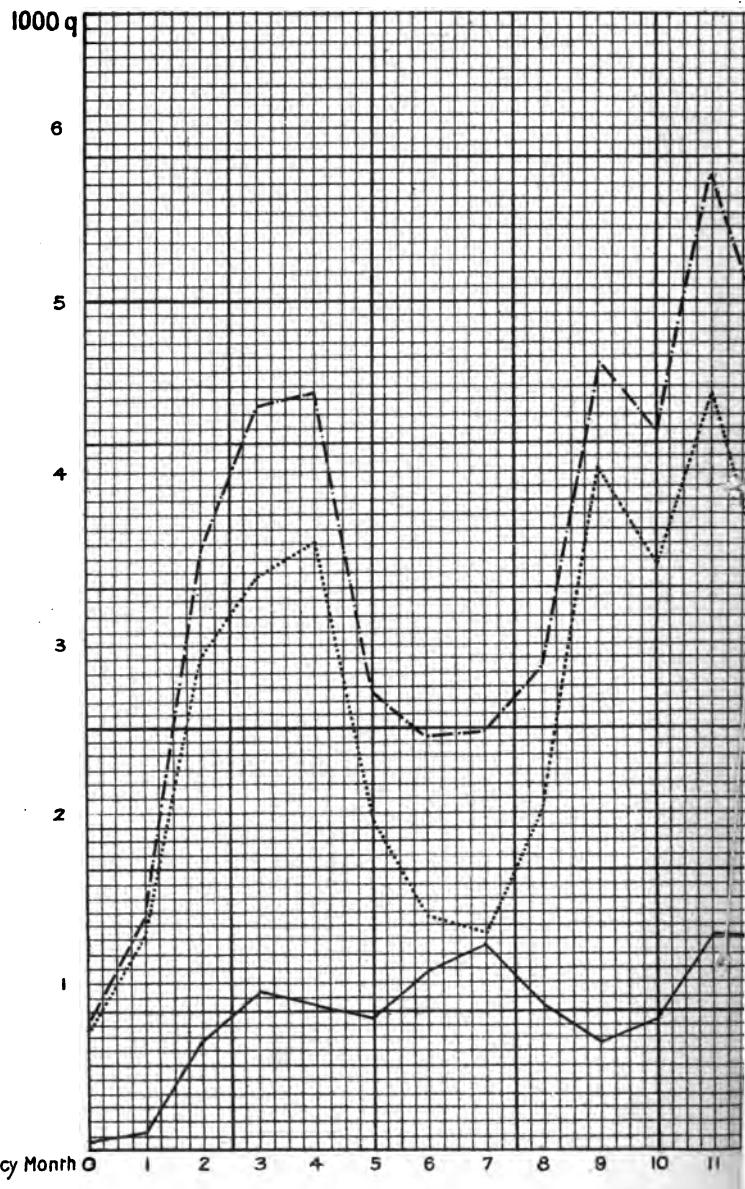
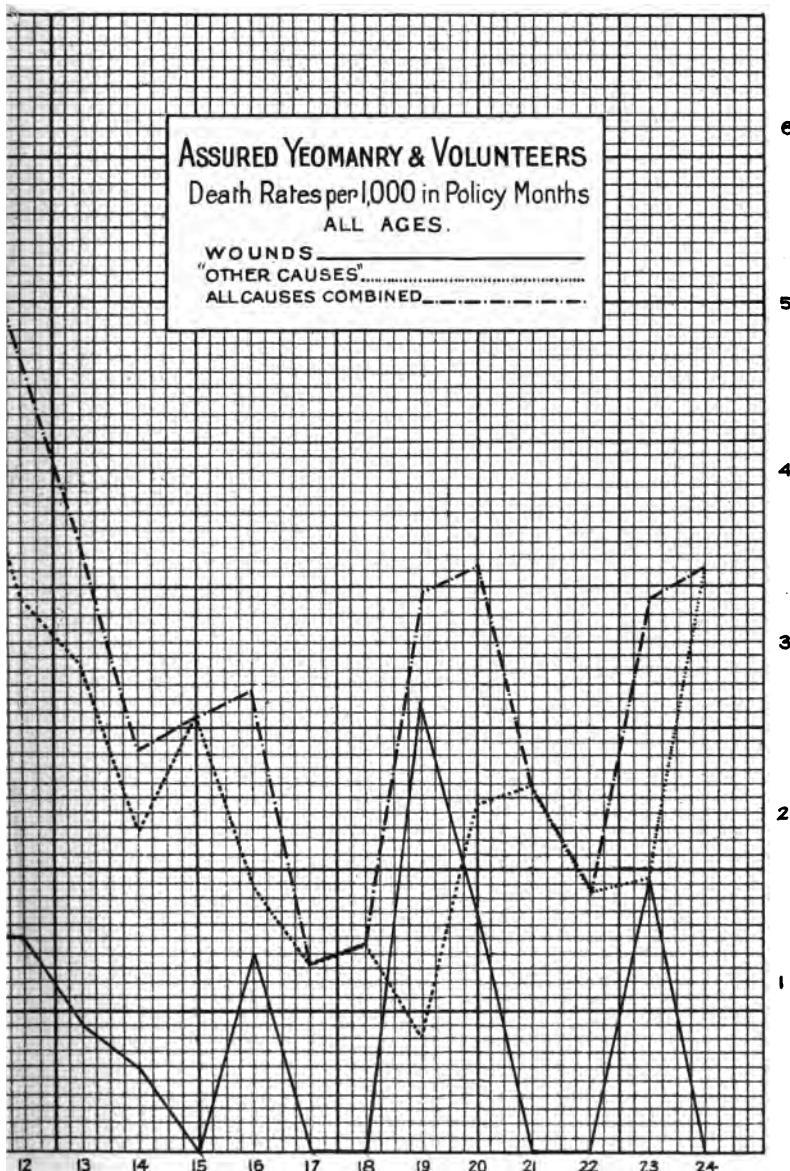
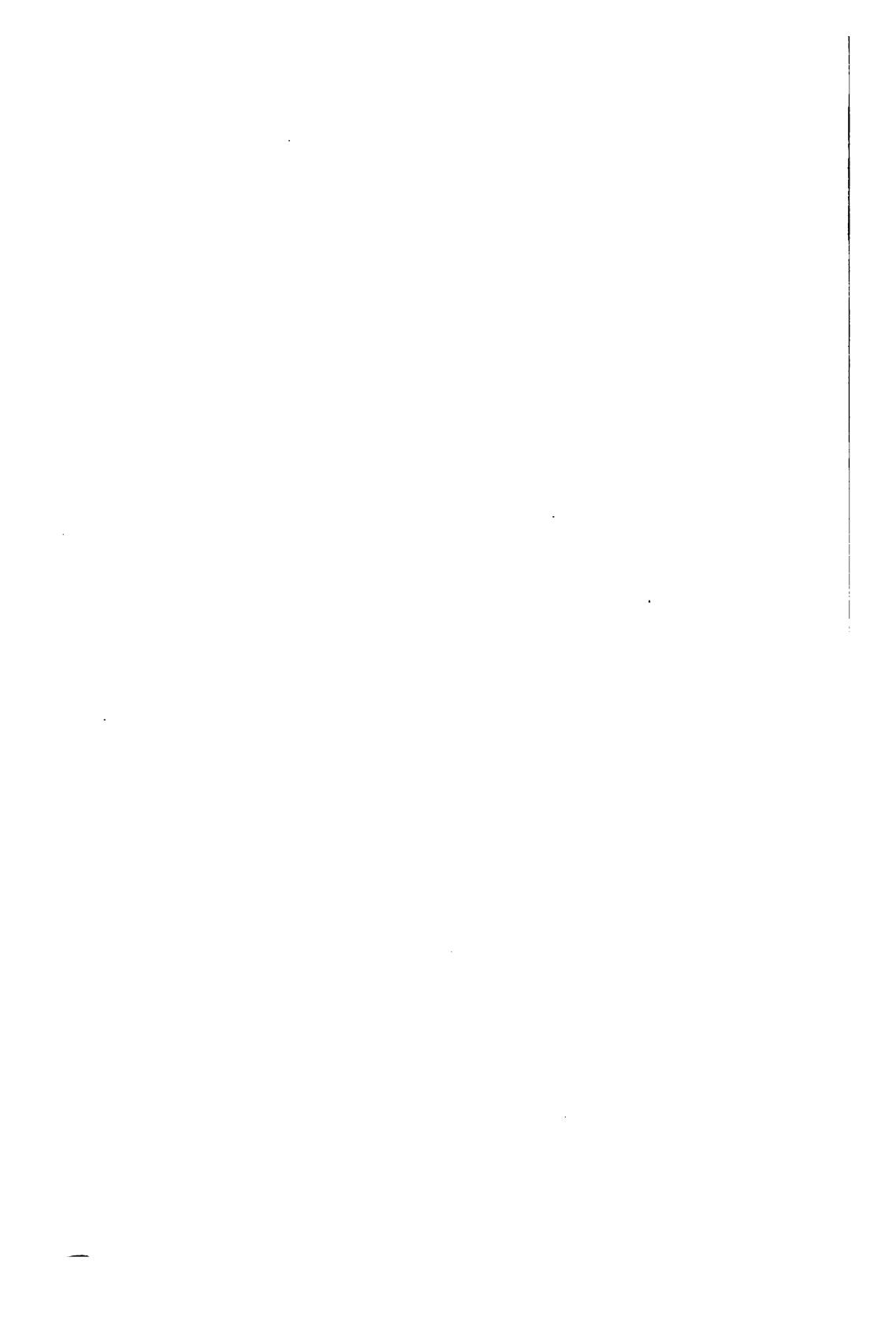


Diagram F.





Looking at Diagram D, we observe that after the first stage of the war, for part of which time there were very few Colonials and no Yeomanry engaged, the Regulars actually had a lower death-rate from wounds than either of the two former bodies, and that this low rate continued throughout the remaining period of the war. This would seem to confirm the suggestion already made, that at this time a large proportion were engaged on service which brought them as a whole less into contact with the enemy, or in which they fought under the advantageous cover of block-houses. The Yeomanry and Colonials follow the same general lines, but the former are again first in the magnitude of the rate. It will be observed that the death-rate of the Yeomanry rises sharply to a high point in May 1900, and again from October 1901 to January 1902. The former was the period of the advance from Bloemfontein to Pretoria, when mounted troops were constantly engaged in skirmishes and actions. The latter period covers the engagements at Zeerust and Tweefontein, in which, it will be remembered, the companies of Yeomanry taking part suffered very severely.

When we turn, however, to the death-rates from "Other Causes" the comparison between the various curves is not quite so simple. The heavy rates during the South African summer are here again very prominent, all the branches of the Service contributing to the rise. The high rate amongst the Regulars up to April 1900 was, of course, occasioned by the hardships of the siege of Ladysmith, the rate amongst all arms immediately after this period being caused (as already referred to) by the rapid advance to Paardeberg and Bloemfontein. The most prominent feature of this diagram is the low death-rate amongst the Colonials. This is in accordance with the common observation that troops engaged in operations in their own country suffer less from disease than when engaged abroad. As the Australian, Canadian and other Colonial troops are included in addition to those raised locally in South Africa, we may take it roughly that the conditions of life in these Colonies approximate so closely to those in South Africa that the Colonials of all kinds were better prepared to fight the causes that produce disease than were the troops from the Mother Country. The rise in the death-rate in the winter (May and June) is also brought out more clearly in the diagram. The extremely heavy death-rate amongst the Yeomanry from November 1900 to March 1901, April 1901 to July 1901, and October 1901 to April 1902, may possibly be explained by the

hardships of the campaigning at these periods, when the mounted troops were often far away from their base, existing on half or quarter rations.

If we exclude the first period of the war, ending after the relief of Ladysmith, it will be observed that the rates amongst the Regulars have a general and steady tendency to decrease. This no doubt may be ascribed to the efficiency with which the medical department of the army did its work.

Table III gives summaries for each subdivision for the whole duration of the war. It consists simply of the totals found in the last lines of Table II. It brings out the same points regarding the death-rates as have been commented upon in reviewing the diagrams, and therefore these need not be further dwelt upon.

Messrs. Smee and Ackland arrive at the conclusion, based on campaigns extending over nearly one hundred years, that the average death-rate of the army in the field is about five per-cent per annum ; they also specially note that the death-rate of the American Civil War was seven per-cent. The death-rate per annum in the recent war for all the forces engaged, according to Table III, including officers and men, was 3.87 per-cent. Taking officers alone, it was 5.3 per-cent, and taking non-commissioned officers and men, 8.81 per-cent.

These annual death-rates practically give the required annual premium per £100 assured according to the actual war experience, including the risk of death from normal mortality, and make allowance for the return of a portion of the premium for any unexpired fraction of a year. They fall considerably below the rates deduced from the mortality of the German Army during the Franco-German War, and compare even more favourably with the death-rates experienced by the Northern Army during the American Civil War.

It should be noted, for it is most important, that the rates are for the period of the war only, and cannot be said to represent the correct extra premium for existing policies at the commencement of the war, or for a new policy to be continued after the expiration of the war. They are, in fact, the term premiums for a temporary assurance. On the one hand, it is true the rates cover the risk of death from normal mortality, but, on the other hand, they do not take into account the probability of deterioration through wounds or disease contracted during the campaign. What the value of this liability to deterioration is, it is impossible to say, but no doubt it is very considerable.

TABLE III.
Comparison of the Totals for all Classes for the whole duration of the War.

N.C.O's AND MEN														
OFFICERS					N.C.O's AND MEN									
Months of Exposure to Risk	Years of Exposure to Risk	Deaths		Death-Rate per 1,000 per annum	Months of Exposure to Risk	Deaths		Years of Exposure to Risk	Death-Rate per 1,000 per annum					
		Wounds	Illness			Wounds	Illness							
161,604	13,467	454	277	731	38,712	20,569	54,281	4,980,325	415,927					
17,844	1,487	73	30	103	49,092	20,175	69,267	368,187	30,632					
53,747	4,479	135	64	199	30,141	14,289	44,430	1,215,484	101,290					
Total (all classes)		238,195	19,433	662	371	1,083	34,066	19,091	53,157					
Total Officers & Men (all classes)		8,707,191	566,432	7,534	14,382	21,916	13,301	25,391	38,692					
Death-Rate per 1,000 per annum														
Wounds					Illness		Total		Wounds		Illness		Total	
Wounds					Total		Total		Wounds		Illness		Total	
Wounds					Total		Total		Wounds		Illness		Total	
Wounds					Total		Total		Wounds		Illness		Total	
Wounds					Total		Total		Wounds		Illness		Total	
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Wounds					Total		Total		Wounds		Illness		Total	
Wounds					Total		Total		Wounds		Illness		Total	

We find that the death-rates varied considerably at different periods of the war, and Tables IV and V have been inserted for the purpose of illustrating this point. For example, in the later stages of the war the mortality among the officers was very much less than in the earlier, owing in some degree no doubt to their ceasing to wear their customary distinctive uniform and badges.

The importance of this feature of the war from an assurance point of view is at once apparent. Any premium calculated on the average death-rate for the whole war might be misleading, for a policyholder has the option of discontinuing his assurance at the end of the first year, and a glance at Table IV will show that the average yearly premium for officers of 5·3 per-cent would have been altogether too small for the first year's risk taken by itself. In this connection, we may note that the death-rate for the first year of the war obtained from the experience of the officers of the combined forces was 7·8 per-cent, falling in the second year to 4·13, remaining almost at the same rate for the third year, namely, 4·24.

Mr. Anderson states in his paper "that an extra premium of "5 per-cent per annum for officers and 2½ per-cent for N.C.O's "and men would have met the case, and that generally an extra "rate of £3. 10s. 0d. per-cent would have been sufficient", and later on he remarks that an office "that charged a premium of "5 per-cent per annum throughout the war would undoubtedly "come out on the right side, and could, in fact, have charged a "much smaller war rate." These quotations are given because we cannot help thinking that they are, to some extent, misleading. From an assurance point of view, officers and men must nearly always be kept apart, and to give premiums founded upon their combined experience is likely to lead officers to imagine that a war risk can be covered by such premiums, and to be disappointed when they find out their mistake. The risk of death to officers and men differs considerably, and it would only be possible, from the point of view of an Assurance Company, to charge the same extra premium for both, if the numbers of officers and men effecting assurances were in the same proportion as exists between officers and men in the whole army, and if the average sum assured were the same for officers as for men. It is difficult to imagine such a state of affairs existing in England, although it is, perhaps, possible in a country where conscription is the rule.

TABLE IV.—*Comparison of Death-Rates for various periods of the War.*

Period	REGULARS, &c.						N.C.O'S AND MEN									
	OFFICERS.			DEATHS			DEATHS			DEATHS						
	MONTHS OF EXPOSURE	YEARS OF EXPOSURE	DEATHS	YEARS DEATH-RATE PER 1,000	MONTHS OF EXPOSURE	YEARS OF EXPOSURE	DEATHS	YEARS DEATH-RATE PER 1,000	MONTHS OF EXPOSURE	YEARS OF EXPOSURE	DEATHS	YEARS DEATH-RATE PER 1,000				
11 Oct. 1899 to 30 Sept. 1900	51,399	4,283	256	119	375	59,771	27,784	87,555	1,665,519	138,793	2,895	8,198	20,858	38,208	59,036	
1 Oct. 1900 to 30 Sept. 1901	65,199	5,433	99	91	190	18,222	16,749	34,971	2,007,913	167,326	1,297	3,696	4,993	7,751	22,089	29,840
1 Oct. 1901 to 31 May 1902	45,006	3,751	99	67	166	26,393	17,862	44,255	3,066,893	108,908	619	2,318	2,937	5,684	21,284	26,968
	161,604	13,467	454	277	731	33,712	20,569	54,281	4,980,325	415,027	4,811	11,317	16,128	11,592	27,268	38,860
GERMANY																
1 Feb. 1900 to 31 Jan. 1901	5,727	477	17	7	24	35,639	14,675	50,314	103,494	8,625	182	328	510	21,102	38,028	59,180
1 Feb. 1901 to 31 Jan. 1902	9,322	777	47	14	61	60,489	18,018	78,507	205,184	17,098	352	507	859	20,587	29,652	50,239
1 Feb. 1902 to 31 May 1902	2,795	233	9	9	18	38,627	38,627	77,254	59,509	4,959	103	207	310	20,770	41,742	62,512
	17,844	1,487	73	30	103	49,092	20,175	69,267	868,187	30,682	637	1,042	1,679	20,761	33,961	54,722
COLONIALS																
1 Dec. 1899 to 30 Nov. 1900	16,610	1,384	61	19	80	44,076	13,728	57,803	375,665	31,305	554	538	1,092	17,697	17,186	34,883
1 Dec. 1900 to 30 Nov. 1901	24,906	2,076	62	29	91	29,865	13,969	43,884	563,243	46,937	629	676	1,305	13,401	14,402	27,803
1 Dec. 1901 to 31 May 1902	12,231	1,019	12	16	28	11,776	15,702	27,478	276,576	23,048	241	438	679	10,456	19,004	29,460
	53,747	4,479	135	64	199	30,141	14,289	44,430	1,215,484	101,290	1,424	1,652	3,076	14,059	16,310	30,369

TABLE V.—*Comparison of Death-Rates amongst the various Classes for different periods of the War.*

N. C. O'S AND MEN											
OFFICERS						DEATHS					
MONTHS OF EXPOSURE	YEARS OF EXPOSURE	DEATHS	YEARLY DEATH-RATE PER 1,000	MONTHS OF EXPOSURE	YEARS OF EXPOSURE	DEATHS	YEARLY DEATH-RATE PER 1,000	MONTHS OF EXPOSURE	YEARS OF EXPOSURE	DEATHS	YEARLY DEATH-RATE PER 1,000
68,016	5,252	191	148	389	36-367	28-180	64-547	2,060,560	171,713	2,223	6,333
5,727	477	17	7	24	35-639	14-675	50-314	108,494	8,625	182	328
17,749	1,479	70	24	94	47-329	16-227	63-566	401,410	33,451	584	639
86,432	7,208	278	179	457	38-563	24-834	63-402	2,565,464	213,789	2,989	7,300
1 FEBRUARY 1900 TO 31 JANUARY 1901											
Regulars, &c.	· ·	65,863	5,487	110	77	187	20-047	14-033	34,080	1,953,395	162,783
Yeomanry	· ·	9,322	777	47	14	61	60-489	18-018	78-507	205,84	17,098
Colonials	· ·	26,334	2,195	53	28	81	24-146	12-756	36-902	596,553	49,628
		101,509	8,459	210	119	329	24-826	14-068	38-894	2,754,112	229,509
1 FEBRUARY 1901 TO 31 JANUARY 1902											
Regulars, &c.	· ·	22,984	1,911	43	45	88	22-501	23-548	46-049	671,428	55,952
Yeomanry	· ·	2,795	233	9	9	18	38-627	38-627	77-254	53,509	4,959
Colonials	· ·	8,064	672	10	11	21	14-881	16-889	31-280	182,342	15,195
		33,793	2,816	62	65	127	22-017	23-032	45-069	913,279	76,106
1 FEBRUARY 1902 TO 31 MAY 1902											
Regulars, &c.	· ·	22,984	1,911	43	45	88	22-501	23-548	46-049	671,428	55,952
Yeomanry	· ·	2,795	233	9	9	18	38-627	38-627	77-254	53,509	4,959
Colonials	· ·	8,064	672	10	11	21	14-881	16-889	31-280	182,342	15,195
		33,793	2,816	62	65	127	22-017	23-032	45-069	913,279	76,106

IMPERIAL YEOMANRY AND VOLUNTEERS—ASSURED LIVES.

Here a card was written for each of the 19,269 lives under observation, showing the policy number, the name, age at entry, date of entry, date of exit, and duration. The summary of the facts dealt with was as follows:—

Number of Policies	...	...	19,269
Of which there—			
Left Active Service, or otherwise passed from observation	...	...	12,515
Died from Wounds	...	193	
Died from other causes	...	638	
		—	831
Existing in South Africa on 31 May 1902, the end of period of observation			
	...	5,923	
Total months of exposure to risk	...	256,450	
Average duration	...	...	13.31 months.

The cards were treated in two distinct ways. They were first sorted into calendar months of the war, so as to compare with the figures given in the general mortality of the Imperial Forces, and then sorted into months of assurance for the purpose of obtaining monetary results, and of tracing the effects of continued exposure to the risks of war, in order to test whether the lives became hardened against disease as time passed. Table VI gives the preliminary facts in calendar months of the war, and is here appended, as it gives information that could be used by anyone desiring to further investigate the subject.

TABLE VI.—*Assured Yeomanry and Volunteers.*

CALENDAR MONTHS.

AGES 23-27.

AGRS 17-22.

Month	No. of Policies Issued	Left Active Service or otherwise withdrew from observation		Died		Sums of Columns (3), (4), (5)		(2)–(6) for preceding Month		Months of Exposure to Risk		Left Active Service or otherwise withdrew from observation		Died		Sums of Columns (3), (4), (5)		(2)–(6) for preceding Month		Months of Exposure to Risk				
		Left	Active	Month	Year	Month	Year	Month	Year	Month	Year	Month	Year	Month	Year	Month	Year	Month	Year	Month	Year			
January 1900	32	1,090	...	...	1900	...	1900	32	1900	1,122	32	1900	41	...	...	3	1,228	1,228	1900	41	1,289	
February	1,274	1	...	1	1900	1,274	1900	2	1,274	2,396	1,339	1,339	...	3	3	6	1,336	2,605	2,605	1900	41	2,605		
March	367	2	...	3	1900	367	1900	5	365	2,761	466	1	1	3	5	5	460	3,065	3,065	1900	41	3,065		
April	296	1	...	1	1900	296	1900	8	10	291	3,052	344	6	5	13	24	339	3,404	3,404	1900	41	3,404		
May	50	12	2	16	1900	50	1900	30	40	3,092	78	21	2	22	45	54	54	3,468	3,468	1900	41	3,468		
June	...	20	4	8	1900	...	1900	32	6	3,098	52	27	2	14	43	7	7	3,465	3,465	1900	41	3,465		
July	36	23	3	6	1900	31	1900	32	1	3,097	83	29	2	9	40	10	10	3,465	3,465	1900	41	3,465		
August	31	17	3	7	1900	31	1900	27	29	3,068	3	14	1	3	18	37	37	3,418	3,418	1900	41	3,418		
September	8	38	2	7	1900	8	1900	47	19	3,049	7	35	4	1	11	3407	3,407	3,407	1900	41	3,407			
October	...	110	1	7	1900	...	1900	118	47	3,002	1	117	6	123	123	123	123	3,368	3,368	1900	41	3,368		
November	9	58	2	8	1900	9	1900	68	115	2,867	5	56	2	16	74	118	118	3,250	3,250	1900	41	3,250		
December	...	44	2	14	1900	...	1900	60	56	2,831	8	58	2	13	73	66	66	3,184	3,184	1900	41	3,184		
January 1901	12	230	2	8	1900	12	1900	240	494	3,325	489	265	...	16	281	416	416	3,600	3,600	1900	41	3,600		
February	554	341	1	14	1900	554	1900	356	2,076	5,401	1,742	337	3	4	344	1,461	1,461	5,061	5,061	1900	41	5,061		
March	2,816	230	3	7	1900	2,816	1900	240	263	5,664	392	292	...	17	309	48	5109	5,109	5,109	1900	41	5,109		
April	619	141	4	20	1900	619	1900	810	99	5,565	85	835	2	21	858	–224	–224	4,885	4,885	1900	41	4,885		
May	...	786	3	11	1900	...	1900	482	789	4,776	17	502	3	10	515	–841	–841	4,044	4,044	1900	41	4,044		
June	1	468	3	12	1900	1	1900	195	470	4,806	14	224	4	3	231	–501	–501	3,543	3,543	1900	41	3,543		
July	12	180	3	2	1900	12	1900	96	191	4,115	1	109	2	6	117	–289	–289	3,313	3,313	1900	41	3,313		
August	4	94	...	2	1900	4	1900	39	45	4,022	...	64	5	4	73	–117	–117	3,196	3,196	1900	41	3,196		
September	8	39	3	3	1900	8	1900	71	5	4,022	2	62	6	...	68	–71	–71	3,125	3,125	1900	41	3,125		
October	3	71	5	76	1900	3	1900	76	42	3,980	2	62	6	...	68	–71	–71	3,087	3,087	1900	41	3,087		
November	1	79	4	11	1900	1	1900	94	75	3,905	...	66	...	66	...	66	–68	–68	3,017	3,017	1900	41	3,017	
December	67	83	4	21	1900	67	1900	108	87	3,868	26	83	5	10	98	–40	–40	2,996	2,996	1900	41	2,996		
January 1902	6	54	1	16	1900	6	1900	71	102	3,766	7	54	1	14	69	–91	–91	2,938	2,938	1900	41	2,938		
February	116	272	10	17	1900	116	1900	299	44	3,810	81	269	9	11	289	12	60	60	2,878	2,878	1900	41	2,878	
March	474	756	3	12	1900	474	1900	771	175	3,985	229	615	5	22	642	–60	–60	2,835	2,835	1900	41	2,835		
April	227	385	8	2	1900	227	1900	890	–544	3,441	99	261	7	268	–543	–543	210	–203	–203	2,132	2,132	1900	41	2,132
May	71	284	...	2	1900	71	1900	236	–319	3,122	65	205	1	4	210	4,932	4,932	2,132	2,132	1900	41	2,132		
	7,826	4,628	69	243	1900	7,826	1900	3,122	4,940	100,538	6,854	4,612	67	253	4,612	67	253	4,932	4,932	1900	41	4,932		

TABLE VI (continued).—Assured Yeomanry and Volunteers.
CALENDAR MONTHS.AGES 28-32.
AGES 33-37.

Month	No. of Policies Issued	Left Active Service or otherwise withdrew from observation	DIED	Sums of Columns (3), (4), (5)	(6)	(7)	(8)	Months of Exposure to Risk	No. of Policies Issued	Sums of Columns (3), (4), (5)		(6)	(7)	(8)
					(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
January 1900	20		...	1	...	1	1	479	20	7	...	...	7	7
February	479		...	1	1	1	1	567	499	260	...	...	260	267
March	568		...	1	1	1	1	1,066	300	1	...	1	300	567
April	230		...	3	3	3	3	229	1,295	1,444	...	...	143	710
May	143	8	...	6	9	9	140	1,435	76	2	1	4	7	76
June	64	3	3	7	13	13	65	1,490	63	1	2	3	56	842
July	40	12	1	7	20	27	15,17	27	4	3	...	7	24	866
August	20	14	1	3	18	...	1,517	9	8	1	...	9	2	868
September	...	10	...	2	12	...	1,499	...	6	1	1	8	—	9
October	2	19	...	3	22	...	1,489	...	8	4	1	13	—	8
November	1	38	4	3	45	...	1,468	...	29	2	...	31	—	13
December	...	24	1	4	29	...	1,423	2	16	1	4	21	—	29
January 1901	4	25	...	3	28	...	25	1,398	2	20	...	1	21	—
February	154	102	4	3	109	126	1,524	85	59	1	...	60	64	854
March	616	156	1	4	161	507	2,031	340	62	2	2	66	280	1,134
April	113	146	...	4	150	—48	1,983	71	69	...	3	72	—	5.
May	48	305	2	3	310	—102	1,881	45	208	...	2	210	—	1,112
June	2	242	...	6	248	—308	1,573	1	155	...	2	157	—	903
July	4	115	...	2	117	—214	1,329	2	55	...	...	55	—	748
August	2	46	1	...	46	—115	1,214	1	15	...	...	15	—	694
September	...	29	...	1	30	—46	1,168	...	14	...	...	14	—	679
October	3	21	2	1	24	—27	1,141	...	20	2	2	24	—	665
November	1	29	1	3	33	—23	1,118	...	21	...	21	—	24	641
December	10	28	2	4	34	—23	1,095	2	13	...	7	20	—	622
January 1902	4	24	1	3	28	—30	1,065	...	17	2	...	19	—	602
February	20	97	3	5	105	—8	1,057	8	68	1	3	67	—	591
March	73	241	...	4	245	—32	1,025	38	138	1	1	140	—	662
April	29	98	...	2	100	—216	809	28	47	2	2	49	—	450
May	24	80	...	1	81	—76	733	19	34	...	...	34	—	420
			27	89	2,022	733	36,862	1,530	1,085	20	39	1,144	—	20,876
												420		

TABLE VI (continued).—*Assured Yeomanry and Volunteers.*
AGES 38-42. CALENDAR MONTHS. AGES 43-47.

Month	No. of Policies Issued	Left Active Service or otherwise withdrew from observation		Sums of Columns (5), (4), (5)	(2)-(6) for preceding Month	(8)	Months of Exposure to Risk	Left Active Service or otherwise withdrew from observation	No. of Policies Issued	Sums of Columns (3), (4), (5)	(6)	(7)	(8)	Months of Exposure to Risk	
		Died	Wounded												
January 1900	53	1	1	2	53	13	13	1	18	13	13	13	13	13	13
February	59	...	...	1	57	24	24	1	24	24	24	24	24	24	24
March	61	...	...	1	51	161	15	1	15	15	15	15	15	15	15
April	10	...	1	2	9	170	5	2	2	2	2	2	2	2	2
May	25	...	...	...	23	193	9	1	1	1	1	1	1	1	1
June	8	...	...	...	3	196	1	1	1	1	1	1	1	1	1
July	6	1	1	1	2	202	1	1	1	1	1	1	1	1	1
August	...	1	1	1	1	200	1	1	1	1	1	1	1	1	1
September	...	4	4	4	2	199	1	1	1	1	1	1	1	1	1
October	...	3	3	1	4	195	4	4	4	4	4	4	4	4	4
November	...	3	3	1	4	191	4	4	4	4	4	4	4	4	4
December	...	1	1	1	1	187	2	2	2	2	2	2	2	2	2
January 1901	12	13	1	1	14	11	198	3	5	5	5	5	5	5	5
February	35	17	1	18	21	219	8	5	5	5	5	5	5	5	5
March	6	21	1	22	-12	207	2	8	8	8	8	8	8	8	8
April	7	19	1	20	-15	192	4	1	1	1	1	1	1	1	1
May	1	36	...	36	-19	173	...	10	2	2	2	2	2	2	2
June	...	23	...	23	-36	187	6	...	...	...	...	...	...	...	...
July	1	7	1	8	-22	115	1	2	2	2	2	2	2	2	2
August	...	2	1	3	-8	107	1	1	1	1	1	1	1	1	1
September	...	6	...	6	-3	104	3	1	1	1	1	1	1	1	1
October	...	4	...	4	-6	98	...	1	1	1	1	1	1	1	1
November	...	5	1	6	-3	95	...	1	1	1	1	1	1	1	1
December	1	14	1	14	1	89	...	1	1	1	1	1	1	1	1
January 1902	3	14	1	14	2	91	1	1	1	1	1	1	1	1	1
February	4	13	1	13	-10	81	1	7	7	7	7	7	7	7	7
March	3	16	1	16	-10	71	...	4	4	4	4	4	4	4	4
April	1	4	...	4	-16	56	...	1	1	1	1	1	1	1	1
May	281	215	3	11	229	56	4,090	87	61	7	1	69	19	19	1,305

TABLE VI (continued).
Assured Yeomanry and Volunteers.

CALENDAR MONTHS.

AGES 48 AND UPWARDS.

Month (1)	No. of Policies Issued. (2)	Left Active Service or otherwise withdrew from observation (3)	DIED		Sums of Cols. (3), (4), (5) (6)	(2) - (6) for pre- ceding month (7)	Exposed to Risk (8)
			Wounds (4)	Illness (5)			
January 1900	...	...	...	...	...	...	...
February	2	...	...	...	...	2	2
March	2	...	...	...	...	2	4
April	5	...	...	...	...	5	9
May	...	...	...	1	1	...	9
June	1	...	...	...	...	...	9
July	...	...	...	...	...	...	9
August	...	1	...	...	1	...	9
September	1	...	...	...	...	...	9
October	...	1	...	...	1	...	9
November	...	...	...	...	...	-1	8
December	...	...	...	...	...	...	8
January 1901	...	...	...	...	...	...	8
February	...	...	...	1	1	...	8
March	5	2	...	...	2	4	12
April	...	...	...	...	...	-2	10
May	...	...	...	...	...	...	10
June	...	...	...	...	...	...	10
July	...	1	...	...	1	...	10
August	...	...	...	...	...	-1	9
September	...	...	...	...	...	...	9
October	...	...	...	...	...	...	9
November	...	2	...	...	2	...	9
December	...	...	...	...	...	-2	7
January 1902	...	...	...	...	...	...	7
February	...	...	...	...	...	...	7
March	...	1	...	...	1	...	7
April	1	...	...	...	...	...	7
May	...	...	...	...	...	...	7
	17	8	...	2	10	7	231

The figures obtained by this Table are described in the paper as those referring to the "Calendar Month" method, the term "Select" being used to denote those obtained in the form of "Policy Months." The age was taken as the age next birthday at entry. The date of entry was taken as the first day of the month in which the policy was issued. It was assumed that the date upon which active service commenced was the same as the date of entry. Thus the results are of double value, enabling us to obtain monetary values, and to trace the effect upon the death-rate of duration of service.

The period at which the lives passed from observation was affected in two ways. In some few cases, the policy was lapsed whilst the assured was still on active service. In these the date of lapse was taken as the last day of the month of renewal, that is, the period at which the days of grace expired. The other way in which lives passed from observation was by the life assured leaving active service whilst the policy still remained in force. In this class we experienced some difficulty in determining the exact date upon which the risk ceased. The date obtained was in some instances that upon which the life assured arrived in England, and in others that upon which he left South Africa. As, however, the forces were not actually disbanded for some little time after, it has been assumed that they remained exposed till the end of the month, an assumption which considerably simplified the work of obtaining the "Exposed to Risk."

The deaths were treated as being exposed for the whole of the month in which they occurred.

These assumptions enabled the "Exposed to Risk" to be obtained by a very simple process, the resulting formula being—

Exposed to risk for calendar month n .

Equals Exposed to risk for month $n-1$.

Minus discontinuances and deaths for month $n-1$.

Plus policies issued during month n .

Table VII summarizes these particulars for all months for each of the various groups of ages.

TABLE VII.

Assured Yeomanry and Volunteers.

CALENDAR MONTHS.

SUMMARY.

ALL MONTHS.

(1)	(2)	(3)	DIED		Sum of Columns (3), (4), (5)	(2)–(6) for preceding month	Exposed to Risk
			Wounds	Illness			
Ages 17–22 . .	7,826	4,628	69	243	4,940	3,122	100,538
Ages 23–27 . .	6,854	4,612	67	253	4,932	2,132	92,548
Ages 28–32 . .	2,674	1,906	27	89	2,022	733	36,862
Ages 33–37 . .	1,530	1,085	20	89	1,144	420	20,876
Ages 38–42 . .	281	215	3	11	229	56	4,090
Ages 43–47 . .	87	61	7	1	69	19	1,305
Ages 48 & upwards	17	8	...	2	10	7	231
Total . .	19,269	12,515	193	638	13,346	6,489	256,450

$$\frac{256,450}{19,269} = 13.31 = \text{Average duration in months.}$$

Table VIII gives the monthly death-rates for the seven groups of ages for each calendar month of the war.

TABLE VIII.—Assured Yeomanry and Volunteers.

CALENDAR MONTHS.

Ages at Entry (1)	Months of Exposure to Risk (2)	JANUARY 1900				FEBRUARY 1900				MARCH 1900				APRIL 1900					
		DEATHS		MONTHLY DEATH-RATE PER 1,000		DEATHS		MONTHLY DEATH-RATE PER 1,000		DEATHS		MONTHLY DEATH-RATE PER 1,000		DEATHS		MONTHLY DEATH-RATE PER 1,000			
		Wounds	Illness	Total	(5)	Wounds	Illness	Total	(8)	Wounds	Illness	Total	(5)	Wounds	Illness	Total	(8)		
17-22	·	32	...	...	(3)	...	...	...	(6)	...	...	...	(2)	...	...	...	(7)
23-27	·	41	...	...	(4)	...	...	...	(5)	...	...	...	(1)	...	...	...	(8)
28-32	·	20	...	...	(3)	...	...	...	(6)	...	...	...	(1)	...	...	...	(7)
33-37	·	7	...	...	(2)	...	...	...	(5)	...	...	...	(1)	...	...	...	(6)
38-42	·	(1)	...	...	...	(4)	...	...	...	(1)	...	...	...	(5)		
43-47	·	(1)	...	...	...	(4)	...	...	...	(1)	...	...	...	(4)		
48 upwards	·	(1)	...	...	...	(4)	...	...	...	(2)	...	...	...	(3)		
All ages	·	100	...	...	(100)	...	...	...	(100)	...	...	...	(3,225)	...	3	...	(930)
17-22	·	2,896	...	1	1	...	...	·417	·417	...	3	3	...	...	326	...	1,087
23-27	·	2,605	...	3	3	1	1	1,162	1,162	3,065	1	3	4	...	979	...	1,305		
28-32	·	1,066	...	1	1	·938	·938	1,295	...	3	3	317	...	2,317	
33-37	·	667	710	1	
38-42	·	110	161	1	1	211	...	6,211
43-47	·	37	52	1	1	231	...	19,231
48 upwards	·	4	9
All ages	·	6,785	...	5	5	·737	·737	8,053	1	11	12	...	124	1,366	1,490

TABLE VIII (continued).—*Assured Yeomanry and Volunteers.*
CALENDAR MONTHS.

Ages at Entry (1)	Months of Exposure to Risk (2)	MAY 1900						JUNE 1900						AUGUST 1900							
		Deaths			MONTHLY DEATH-RATE PER 1,000			Deaths			MONTHLY DEATH-RATE PER 1,000			Deaths			MONTHLY DEATH-RATE PER 1,000				
		Wounds (3)	Illness (4)	Total (5)	Wounds (6)	Illness (7)	Total (8)	Wounds (3)	Illness (4)	Total (5)	Wounds (6)	Illness (7)	Total (8)	Wounds (3)	Illness (4)	Total (5)	Wounds (6)	Illness (7)	Total (8)		
17-22	3,052	1	8	9	·328	2·621	2·949	3,092	2	16	18	·647	5·175	5·822	3,097	3	6	9	·939	1·937	
23-27	3,404	5	13	18	1·469	3·819	5·288	3,458	2	22	24	·578	6·362	6·940	3,455	2	9	11	·579	2·905	
28-32	1,435	...	6	6	...	4·181	4·181	1,490	3	7	10	2·013	6·698	6·711	1,517	1	3	4	·659	1·978	
33-37	786	1	4	5	1·272	5·089	6·361	842	...	2	2	2·375	2·375	868	1	1	1	...	1·152
38-42	170	1	1	2	5·882	5·882	11·764	193	202	1	1	1	...	4·951
43-47	55	2	2	2	36·364	36·364	62	36·364	62	...	...	...	...	...	...	...	...	...	...	...
48 upwards	9	...	1	1	...	111·111	111·111	9	...	...	...	...	...	...	...	...	...	...	...	...
All ages	8,911	10	33	43	1·122	3·703	4·825	9,146	7	47	54	·765	5·139	5·904	9,211	7	19	26	·780	2·063	
JULY 1900																					
17-22	3,098	4	8	12	1·291	2·582	3·873	3,097	3	6	6	·939	1·937	2·906	3,465	2	9	11	·579	3·184	
23-27	3,465	2	14	16	·577	4·040	4·617	3,455	2	9	9	...	...	2·637	1,517	1	3	4	...	1·978
28-32	1,517	1	7	8	·659	4·614	5·273	1,517	1	3	1	1·152	...	1·152	866	3	1	1	...	4·951	
33-37	866	3	...	3	3·464	...	3·464	868	...	202	1	1	...	...	...	...	...	...	...	...
38-42	196	...	1	1	15·873	...	15·873	63	...	...	...	...	...	...	...	...	...	...	...	...
43-47	63	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
48 upwards	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
All Ages	9,214	11	29	40	1·194	3·147	4·341	9,211	7	19	26	·780	2·063	2·823	9,211	7	19	26	·780	2·063	

TABLE VIII (continued).—Assured Yeomanry and Volunteers.

CALENDAR MONTHS.

TABLE VIII (continued).—*Assured Economy and Volunteers.*
CALENDAR MONTHS.

Age at Entry (1)	JANUARY 1901						FEBRUARY 1901						MARCH 1901						APRIL 1901					
	Deaths			MONTHLY DEATH-RATE PER 1,000			Deaths			MONTHLY DEATH-RATE PER 1,000			Deaths			MONTHLY DEATH-RATE PER 1,000			Deaths			MONTHLY DEATH-RATE PER 1,000		
	Months of Exposure to Risk (2)	Wounds (3)	Illness (4)	Wounds (5)	Illness (6)	Total (6)	Wounds (7)	Illness (7)	Total (8)	Wounds (9)	Illness (10)	Total (10)	Wounds (11)	Illness (12)	Total (12)	Wounds (13)	Illness (14)	Total (14)	Wounds (15)	Illness (16)	Total (16)	Wounds (17)	Illness (18)	Total (18)
17-22	2,831	2	14	16	706	4.945	5.651	3,325	2	8	10	602	2.406	3.008	3,327	2.444	3.008	3,327	2.444	3.008	3,327	2.444	3.008	3,327
23-27	3,184	2	18	15	628	4.033	4.711	3,600	...	16	16	625	2.625	3.069	4.594	1.969	2.017	3.069	1.969	2.017	3.069	1.969	2.017	3.069
28-32	1,398	...	3	3	...	2.146	2.146	1,524	4	8	7	1.171	1.171	...	1.171	...	...	1.171	...	...	1.171	...	...	1.171
33-37	790	...	1	1	...	1.286	1.286	854	1	...	1	1	1	...	1	...	1	...	1	...	1	...	1	...
38-42	187	...	...	...	...	...	...	198	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43-47	60	...	...	...	...	...	...	61	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
48 upwards.	8	...	...	...	...	...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
All Ages	8,458	4	31	35	473	3.635	4.138	9,570	7	29	36	731	3.030	3.761	3,327	2.444	3.008	3,327	2.444	3.008	3,327	2.444	3.008	3,327
17-22	5,401	1	14	15	185	2.592	2.777	5,664	3	7	10	530	1.926	1.766	3,327	2.444	3.008	3,327	2.444	3.008	3,327	2.444	3.008	3,327
23-27	5,061	3	4	7	593	.790	1.383	5,109	...	17	17	...	...	...	...	...	...	...	...	...	...	...	...	...
28-32	2,031	1	4	6	492	1.939	2.461	1,983	...	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...
33-37	1,184	2	2	4	1764	1.764	3.528	1,139	...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...
38-42	219	...	1	1	...	4.566	4.566	207	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...
43-47	64	...	...	...	...	...	...	61	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
48 upwards.	12	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
All Ages	13,922	7	25	32	503	1.796	2.299	14,173	3	32	35	212	2.258	2.470	3,327	2.444	3.008	3,327	2.444	3.008	3,327	2.444	3.008	3,327

TABLE VIII (continued).—Assured Yeomanry and Volunteers.

CALENDAR MONTHS.

Ages at Entry (1)	Months of Exposure to Risk (2)	MAY 1901					JUNE 1901					AUGUST 1901						
		DEATHS			MONTHLY DEATH-RATE PER 1,000		Months of Exposure to Risk (2)	DEATHS			MONTHLY DEATH-RATE PER 1,000		Months of Exposure to Risk (2)	DEATHS				
		Wounds (3)	Illness (4)	Total (5)	Wounds (6)	Illness (7)		Wounds (3)	Illness (4)	Total (8)	Wounds (6)	Illness (7)		Wounds (3)	Illness (4)	Total (8)		
17-22	5,565	4	20	24	719	3,594	4,776	3	11	14	628	2,303	4,776	2	2	2,931		
23-27	4,885	2	21	23	409	4,289	4,044	3	10	13	742	2,473	3,215	1	1	3,215		
28-32	1,881	2	3	5	1,063	1,595	2,058	1,573	6	6	...	3,814	3,814	1	1	3,814		
33-37	1,112	...	2	2	...	1,789	1,789	903	2	2	...	2,215	2,215	1	1	2,215		
38-42	192	...	1	1	...	5,208	5,208	173	56	2	...	35,714	35,714	1	1	35,714		
43-47	57	...	...	...	...	...	...	...	10	...	...	...	...	1	1	...
48 upwards	10	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...
All Ages	13,702	8	47	55	584	3,430	4,014	11,635	8	29	37	694	2,514	3,208	1	1	3,208	
JULY 1901																		
17-22	4,306	3	12	15	697	2,787	3,484	4,115	2	2	...	604	...	486	1	1	486	
23-27	3,543	4	3	7	1,129	847	1,976	3,313	2	6	...	824	...	2,415	1	1	2,415	
28-32	1,829	...	2	2	...	1,505	1,505	1,214	1	1	324	1	1	324	
33-37	748	694	...	1	8,696	8,696	1	1	8,696
38-42	137	115	1	1	...
43-47	44	89	1	1	...
48 upwards	10	9	1	1	...	
All Ages	10,117	7	17	24	692	1,680	2,372	9,499	3	9	12	316	...	947	1	1	1,263	

TABLE VIII (continued).—*Assured Yeomanry and Volunteers.* CALENDAR MONTHS.

Age at Entry (1)	SEPTEMBER 1901						OCTOBER 1901							
	Months of Exposure to Risk (2)	Deaths			Monthly Death-Rate per 1,000			Months of Exposure to Risk (2)	Deaths			Monthly Death-Rate per 1,000		
		Deaths (3)	Wounds (4)	Illness (5)	Total (6)	Wounds (6)	Illness (7)	Total (8)	Wounds (8)	Illness (9)	Total (10)	Wounds (10)	Illness (11)	Total (12)
17-22	4,022	3	3	6	12	746	1,492	3,980	5	..	5	1,256	..	1,256
23-27	3,196	5	4	9	1,564	1,252	2,816	3,125	6	..	6	1,920	..	1,920
28-32	1,168	..	1	1	..	856	856	1,141	2	1	3	1,753	..	2,629
33-37	679	..	..	..	..	..	..	685	2	2	4	3,008	3,008	6,016
38-42	107	1	..	1	9346	..	9346	104	..	1	..	2778	..	2778
43-47	37	..	..	..	..	..	..	36	1	..	..	..	..	..
48 upwards.	9	..	..	..	..	..	..	9	..	..	..	..	..	..
All ages	9,218	9	8	17	976	..	..	9,060	16	3	19	1,766	331	2,097
NOVEMBER 1901													DECEMBER 1901	
17-22	3,905	4	11	15	1,024	2,817	3,841	3,868	4	21	25	1,084	5,429	6,463
23-27	3,057	..	..	..	..	..	..	3,017	5	10	15	1,657	3,315	4,972
28-32	1,118	1	3	4	894	2,683	3,577	1,095	2	4	6	1,826	3,653	5,479
33-37	641	..	..	..	..	..	..	692	..	7	7	10,254	11,254	10,526
38-42	98	..	..	..	..	..	..	95	1	..	1	31,250	31,250	31,250
43-47	32	..	..	..	..	..	..	32	1	..	..	..	..	..
48 upwards.	9	..	..	..	..	..	..	7	..	..	..	..	..	..
All ages	8,860	6	14	19	564	1,580	2,144	8,736	13	42	55	1,488	4,808	6,296

TABLE VIII (continued).—*Assured Yeomanry and Volunteers.*
CALENDAR MONTHS.

Ages at Entry (1)	Months of Exposure to Risk (2)	JANUARY 1902				FEBRUARY 1902				MARCH 1902				APRIL 1902			
		DEATHS		MONTHLY DEATH-RATE PER 1,000		DEATHS		MONTHLY DEATH-RATE PER 1,000		DEATHS		MONTHLY DEATH-RATE PER 1,000		DEATHS		MONTHLY DEATH-RATE PER 1,000	
		Wounds (3)	Illness (4)	Total (5)	Wounds (6)	Illness (7)	Total (8)	Wounds (3)	Illness (4)	Total (6)	Wounds (3)	Illness (4)	Total (6)	Wounds (3)	Illness (4)	Total (6)	
17-22	3,766	1	16	17	.266	4.249	4.515	3,810	10	17	.265	4.462	7.087				
23-27	2,926	1	14	15	.342	4.785	5.127	2,938	9	11	.20	3.063	3.744	6.907			
28-32	1,065	1	3	4	.989	2.817	3.756	1,057	3	5	.8	2.838	4.730	7.563			
33-37	602	...	2	2	...	3.322	3.322	591	1	3	4	1.692	5.076	6.768			
38-42	89	...	...	...	...	...	...	91	...	...	...	...	...	...	...	...	...
43-47	30	...	...	...	...	...	...	30	7	...	...	...	...	...	...	...	...
48 upwards	7	...	...	...	...	...	...				
All Ages	8,485	3	35	38	.354	4.125	4.479	8,524	23	36	59	2.698	4.223	6.921			
17-22	3,985	3	12	15	.753	3.011	3.764	3,441	3	2	5	.872	.581	1.453			
23-27	2,878	5	22	27	1.737	7.644	9.381	2,385	...	7	7	...	2.998	2.998			
28-32	1,025	4	4	4	...	3.902	3.902	909	...	2	2	2	...	2.472	2.472		
33-37	562	1	1	2	1.779	3.568	3.568	450	...	2	2	2	...	4.444	4.444		
38-42	81	...	...	...	...	...	...	71	...	...	...	...	...	...	...	...	...
43-47	30	...	...	...	...	...	...	23	...	...	...	...	...	...	...	...	...
48 upwards	7	...	...	...	...	...	...	7	...	...	...	...	...	...	...	...	...
All Ages	8,568	9	39	48	1.050	4.552	5.602	7,136	3	13	16	.420	1.822	2.212			

TABLE VIII (continued).
Assured Yeomanry and Volunteers.

CALENDAR MONTHS.

		MAY 1902					
Ages at Entry (1)	Months of Exposure to Risk (2)	DEATHS			MONTHLY DEATH-RATE PER 1,000		
		Wounds (3)	Illness (4)	Total (5)	Wounds (6)	Illness (7)	Total (8)
17-22 . .	3,122	...	2	2	...	·641	·641
23-27 . .	2,132	1	4	5	·469	1·876	2·345
28-32 . .	733	...	1	1	...	1·364	1·364
33-37 . .	420	...	...	...	...	...	...
38-42 . .	56	...	...	...	...	...	...
43-47 . .	19	...	...	...	...	...	...
48 upwards . .	7	...	...	...	...	...	...
All Ages . .	6,489	1	7	8	·154	1·079	1·233

In column 2 are entered the months of exposure, and in columns 3, 4, and 5, the corresponding deaths; these figures being simply copied from Table VI. Columns 6, 7, and 8 give the monthly death-rates per 1,000 for the particular group of ages from wounds, from other causes, and from all causes combined, respectively.

Table IX gives a summary of the results for all ages in calendar months of the war.

The total rates for all ages obtained by the calendar month method have been reproduced in the form of curves in Diagrams C, D and E. It will be seen on comparing the death-rates of the assured Yeomanry and Volunteers with those of the whole of the Yeomanry deduced from the official War Office returns, that the rates of the former are considerably the lower. There are two or three reasons for this, the chief being the different methods which we were compelled to adopt in obtaining the time of exposure to risk. As already explained, all the official War Office returns assumed the period of risk to commence upon landing in South Africa, and to end upon leaving that country. The assured lives on the other hand were assumed to commence their period of risk before sailing from the United Kingdom, and to end it on their return. Again, during the last eight or nine months of the war, a number of Yeomanry were kept at home

under orders, but did not actually sail for some months. In the assured experience they were treated as at risk for the whole period. As far as the calculation of war risk premiums is concerned, it would seem to be more correct to make the assumption used for assured lives, as an extra premium is usually paid before the policyholder leaves the United Kingdom.

TABLE IX.
Assured Yeomanry and Volunteers.
ALL AGES.
SUMMARY IN CALENDAR MONTHS.

Month	Months of Exposure to Risk	DEATHS			MONTHLY DEATH-RATE PER 1,000		
		Wounds	Illness	Total	Wounds	Illness	Total
January 1900	100	...	...	...	...	...	...
February	3,225	...	3	3	...	·930	·930
March	6,785	...	5	5	...	·737	·737
April	8,053	1	11	12	·124	1·366	1·490
May	8,911	10	33	43	1·122	3·703	4·825
June	9,146	7	47	54	·765	5·139	5·904
July	9,214	11	29	40	1·194	3·147	4·341
August	9,211	7	19	26	·760	2·063	2·823
September	9,116	5	13	18	·548	1·426	1·974
October	9,066	10	12	22	1·103	1·324	2·427
November	8,941	7	17	24	·783	1·901	2·684
December	8,630	6	33	39	·695	3·824	4·519
January 1901	8,458	4	31	35	·473	3·665	4·188
February	9,570	7	29	36	·731	3·030	3·761
March	13,922	7	25	32	·503	1·796	2·299
April	14,173	3	32	35	·212	2·258	2·470
May	13,702	8	47	55	·584	3·430	4·014
June	11,535	8	29	37	·694	2·514	3·208
July	10,117	7	17	24	·692	1·680	2·372
August	9,499	3	9	12	·316	·947	1·263
September	9,218	9	8	17	·976	·868	1·844
October	9,060	16	3	19	1·766	·331	2·097
November	8,860	5	14	19	·564	1·580	2·144
December	8,736	13	42	55	1·488	4·808	6·296
January 1902	8,485	3	35	38	·354	4·125	4·479
February	8,524	23	36	59	2·698	4·223	6·921
March	8,568	9	39	48	1·050	4·552	5·602
April	7,136	3	13	16	·420	1·822	2·242
May	6,489	1	7	8	·154	1·079	1·233
Total	256,450	193	638	831	·753	2·488	3·241

A third reason was the inclusion of Volunteers with the Yeomanry in the assured investigation. Although the larger number were Yeomanry, yet the inclusion of Volunteers

undoubtedly tended to lower the death-rate, for the latter were not, on the average, placed in positions of such danger as the former.

In Diagram E we see that the curve for the assured lives has very much the same conformation as that of the Yeomanry, being above it, however, at first, but later on falling appreciably below.

It will be remembered that the Yeomanry went out in three detachments, the first going out about February 1900, the second about a year later, whilst the third did not go out till very near the close of the war. It has been said that the second detachment were much inferior in general physique to the first, and possibly this may account for some of the divergences of the curves in the later stages of the war, as the proportion of assured in the second detachment was not so great as in the first. Another point may be suggested, though it would be unsafe to place any stress upon it from the diagram before us; namely, that the course of time enabled the Yeomanry of 1900 to become more acclimatized, or at all events more accustomed to the new life of hardship and fatigue. This may, however, better be discussed by the use of the "Policy Months" method.

Table X gives the original facts in months of exposure to risk for each month of assurance for each of the seven groups of ages, arranged in such a manner as to allow of the exposed to risk for yearly rates of mortality being obtained as well as for monthly, these two rates being convenient for the calculation of premiums.

As in the calendar month method, the discontinuances and the deaths were treated as being at risk until the end of the assurance month in which they occurred, the entrants being treated as coming in at the beginning of the month.

The exposed to risk for the monthly rate were thus obtained by a method similar to that adopted for the calendar month system.

For the yearly rate the exposed to risk were obtained by leaving in the deaths during intervening months, and subtracting them only at the close of the 12th, 24th, and 29th month, respectively.

TABLE X.
Assured Yeomanry and Volunteers.

SELECT.

ENTERED 7,826.

AGES 17—22.

Month (n)	Existing	Left Active Service or otherwise withdrew from observation	DIED			Col. (2) + Col. (8)	Col. (6) + Col. (7)	MONTHS OF EXPOSURE	
			Wounds	Illness	Total			For Monthly Rate	For Yearly Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	72	9	1	2	3	81	84	7,826	7,826
2	221	30	1	6	7	251	258	7,742	7,745
3	460	43	3	21	24	503	527	7,484	7,494
4	113	50	9	20	29	163	192	6,957	6,991
5	6	54	3	24	27	60	87	6,765	6,828
6	56	61	6	14	20	117	137	6,678	6,768
7	1	68	5	6	11	69	80	6,541	6,651
8	2	75	7	12	19	77	96	6,461	6,582
9	2	104	6	19	25	106	131	6,365	6,505
10	4	162	1	27	28	166	194	6,234	6,399
11	9	85	4	25	29	94	123	6,040	6,238
12	15	140	6	35	41	155	196	5,917	6,139
13	110	1,832	7	7	14	1,942	1,956	5,721	5,721
14	223	216	5	7	12	439	451	3,765	3,779
15	1,124	531	1	2	3	1,655	1,658	3,314	3,340
16	282	515	...	8	8	797	805	1,656	1,685
17	2	246	...	2	2	248	250	851	888
18	...	55	...	...	...	55	55	601	640
19	...	31	...	...	...	31	31	546	585
20	...	17	2	...	2	17	19	515	554
21	...	19	1	1	2	19	21	496	537
22	6	28	..	1	1	34	35	475	518
23	9	15	..	..	..	24	24	440	484
24	4	13	1	1	2	17	19	416	460
25	17	218	..	1	1	235	236	397	397
26	33	4	..	2	2	37	39	161	162
27	69	3	..	..	..	72	72	122	125
28	45	3	..	..	..	48	48	50	53
29	1	1	..	..	..	2	2	2	5
...	2,886	4,628	69	243	312	7,514	7,826	100,538	102,094

TABLE X (continued).
Assured Yeomanry and Volunteers.

SELECT.

ENTERED 6,854.

AGES 23—27.

Month (n)	Existing	Left Active Service or otherwise withdrew from observa- tion	DIED			Col (2)+ Col (3)	Col (6)+ Col (7)	MONTHS OF EXPOSURE	
			Wounds	Illness	Total			For Monthly Rate	For Yearly Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	66	4	...	8	8	70	78	6,854	6,854
2	97	16	...	12	12	113	125	6,776	6,784
3	222	26	5	21	26	248	274	6,651	6,671
4	79	47	5	25	30	126	156	6,377	6,423
5	6	49	8	23	31	55	86	6,221	6,297
6	25	58	3	16	19	83	102	6,135	6,242
7	...	62	8	12	20	62	82	6,033	6,159
8	2	81	7	6	13	83	96	5,951	6,097
9	...	103	3	4	7	103	110	5,855	6,014
10	1	166	6	23	29	167	196	5,745	5,911
11	12	103	3	19	22	115	137	5,549	5,744
12	13	160	8	22	30	178	203	5,412	5,629
13	66	1,647	6	31	37	1,713	1,750	5,209	5,209
14	152	234	2	13	15	386	401	3,459	3,496
15	794	477	2	8	10	1,271	1,281	3,058	3,110
16	226	587	...	3	3	813	816	1,777	1,889
17	3	267	...	1	1	270	271	961	1,026
18	...	92	...	...	...	92	92	690	756
19	1	52	...	1	1	53	54	598	664
20	...	23	1	1	2	23	25	544	611
21	...	19	...	...	...	19	19	519	588
22	4	24	...	...	...	28	28	500	569
23	7	16	...	...	...	23	23	472	541
24	8	18	...	1	1	26	27	449	518
25	14	259	...	2	2	278	275	422	422
26	21	5	...	1	1	26	27	147	149
27	47	12	...	...	...	59	59	120	123
28	55	3	...	...	...	58	58	61	64
29	1	2	...	...	...	8	3	8	6
...	1,922	4,612	67	253	320	6,534	6,854	92,548	94,516

TABLE X (continued).
Assured Yeomanry and Volunteers.
 SELECT. ENTERED 2,674.
 AGES 28—32.

Month (n)	Existing	Left Active Service or otherwise withdrew from observation	DIED			Col. (2)+ Col. (8)	Col. (6)+ Col. (7)	MONTHS OF EXPOSURE	
			Wounds	Illness	Total			For Monthly Rate	For Yearly Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	24	3	..	2	2	27	29	2,674	2,674
2	29	3	..	4	4	32	36	2,645	2,647
3	69	15	1	6	7	84	91	2,609	2,615
4	20	18	2	11	13	38	51	2,518	2,531
5	4	15	2	13	15	19	34	2,467	2,493
6	9	22	2	2	4	31	35	2,433	2,474
7	1	26	1	4	5	27	32	2,398	2,443
8	1	38	2	1	3	39	42	2,366	2,416
9	..	41	2	6	8	41	49	2,324	2,377
10	3	58	2	10	12	61	73	2,275	2,336
11	..	44	4	3	7	44	51	2,202	2,275
12	2	74	4	8	12	76	88	2,151	2,281
13	38	695	2	6	8	733	741	2,068	2,068
14	35	89	..	4	4	124	128	1,322	1,380
15	256	207	1	4	5	463	468	1,194	1,206
16	64	231	..	..	..	295	295	726	743
17	2	128	..	1	1	130	131	431	448
18	..	34	..	1	1	34	35	300	318
19	1	19	..	1	1	20	21	265	284
20	..	5	..	..	..	5	5	244	264
21	..	7	1	1	2	7	9	239	259
22	4	5	..	..	..	9	9	230	252
23	5	11	..	..	..	16	16	221	243
24	7	8	1	..	1	15	16	205	227
25	12	102	..	..	..	114	114	189	189
26	11	3	..	1	1	14	15	75	75
27	24	2	..	..	..	26	26	60	61
28	29	3	..	..	..	32	32	34	35
29	2	..	..	..	..	2	2	2	3
...	652	1,906	27	89	116	2,558	2,674	36,862	37,512

TABLE X (continued).
Assured Yeomanry and Volunteers.
 SELECT. ENTERED 1,580.
 AGES 38-37.

Month (n)	Existing	Left Active Service or otherwise withdrew from observation	DIED			Col. (2)+ Col. (8)	Col. (6)+ Col. (7)	MONTHS OF EXPOSURE	
			Wounds	Illness	Total			For Monthly Rate	For Yearly Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	18	2	...	...	...	20	20	1,580	1,580
2	28	6	1	1	2	34	36	1,510	1,510
3	37	5	1	4	5	42	47	1,474	1,476
4	9	8	...	3	3	17	20	1,427	1,434
5	...	7	1	1	2	7	9	1,407	1,417
6	2	11	2	1	3	13	16	1,398	1,410
7	...	17	3	1	4	17	21	1,382	1,397
8	...	19	4	2	6	19	25	1,361	1,380
9	...	31	3	4	7	31	38	1,336	1,361
10	1	44	...	3	3	45	48	1,298	1,330
11	1	29	1	4	5	30	35	1,250	1,285
12	...	57	1	2	3	57	60	1,215	1,255
13	35	387	3	1	4	422	426	1,155	1,155
14	29	32	...	3	3	61	64	729	733
15	144	120	...	2	2	264	266	665	672
16	36	140	...	1	1	176	177	399	408
17	2	57	...	...	...	59	59	222	232
18	1	17	...	...	...	18	18	163	173
19	...	6	...	...	...	6	6	145	155
20	...	5	...	...	...	5	5	138	149
21	...	7	...	1	1	7	8	134	144
22	3	5	...	2	2	8	10	126	137
23	1	4	...	2	2	5	7	116	129
24	1	2	...	...	...	3	3	109	124
25	3	62	...	1	1	65	66	106	106
26	10	3	...	...	...	13	13	40	41
27	15	1	...	...	...	16	16	27	28
28	8	1	...	...	...	9	9	11	12
29	2	...	...	...	...	2	2	2	3
...	886	1,085	20	89	59	1,471	1,580	20,876	21,186

TABLE X (continued).
Assured Yeomanry and Volunteers.

SELECT.

ENTERED 281.

AGES 38-42.

Month (n)	Existing	Left Active Service or otherwise withdrew from observation	DIED			Col. (2)+ Col. (3)	Col. (6)+ Col. (7)	MONTHS OF EXPOSURE	
			Wounds	Illness	Total			For Monthly Rate	For Yearly Rate
(1)	(2)	(8)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	2	1	...	2	2	3	5	281	281
2	2	...	...	1	1	2	3	276	278
3	4	...	1	2	3	4	7	273	276
4	3	1	...	...	...	4	4	266	272
5	...	1	...	1	1	1	2	262	268
6	1	2	...	...	...	3	3	260	267
7	...	2	1	...	1	2	3	257	264
8	...	3	...	...	...	3	3	254	262
9	...	10	...	...	...	10	10	251	259
10	1	1	1	1	2	2	4	241	249
11	...	4	...	1	1	4	5	237	247
12	1	6	...	...	...	7	7	232	243
13	6	78	...	2	2	84	86	225	225
14	...	11	...	...	...	11	11	189	141
15	17	15	...	...	...	32	32	128	130
16	5	28	...	...	...	33	33	96	98
17	...	12	...	...	...	12	12	63	65
18	...	4	...	1	1	4	5	51	53
19	...	2	...	...	...	2	2	46	49
20	...	1	...	...	...	1	1	44	47
21	...	4	...	...	...	4	4	43	46
22	...	...	...	...	...	...	...	39	42
23	...	3	...	...	...	3	3	39	42
24	2	3	...	...	...	5	5	36	39
25	...	21	...	...	...	21	21	31	31
26	2	...	...	...	...	2	2	10	10
27	4	2	...	...	...	6	6	8	8
28	2	...	...	...	...	2	2	2	2
29	...	...	...	...	...	...	...	...	...
...	52	215	3	11	14	267	281	4,090	4,194

TABLE X (continued).
Assured Yeomanry and Volunteers.
 SELECT. ENTERED 87.
 AGES 43-47.

Month (*)	Existing	Left Active Service or otherwise withdrew from observa- tion	DIED			Col. (2)+ Col. (3)	Col. (6)+ Col. (7)	MONTHS OF EXPOSURE	
			Wounds	Illness	Total			(8)	(9)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	...	...	...	...	...	...	...	87	87
2	...	1	...	1	1	1	2	87	87
3	1	1	1	...	1	2	3	85	86
4	...	...	1	...	1	...	1	82	84
5	...	...	1	...	1	...	1	81	84
6	...	...	...	...	...	...	...	80	84
7	...	1	...	...	...	1	1	80	84
8	...	...	...	...	...	...	...	79	83
9	...	2	...	...	...	2	2	79	83
10	1	1	...	...	...	2	2	77	81
11	...	5	...	...	...	5	5	75	79
12	...	3	...	...	...	3	3	70	74
13	3	19	...	...	...	22	22	67	67
14	2	3	...	...	...	5	5	45	45
15	4	3	...	...	...	7	7	40	40
16	2	4	3	...	3	6	6	33	33
17	...	4	3	...	3	4	7	27	27
18	...	8	...	...	...	3	3	20	23
19	...	1	...	...	...	1	1	17	20
20	...	1	1	...	1	1	2	16	19
21	...	...	...	...	...	...	...	14	18
22	...	1	...	...	...	1	1	14	18
23	...	...	...	...	...	...	...	13	17
24	...	1	...	...	...	1	1	13	17
25	...	7	...	...	...	7	7	12	12
26	1	...	...	...	...	1	1	5	5
27	1	...	...	...	...	1	1	4	4
28	3	...	...	...	...	3	3	3	3
29	...	...	...	...	...	...	...	...	...
...	18	61	7	1	8	79	87	1,305	1,364

TABLE X (continued).

Assured Yeomanry and Volunteers.

SELECT.

ENTERED 17.

AGES 48 AND UPWARDS.

Month (n)	Existing (2)	Left Active Service or otherwise withdrew from observation (3)	DIED			Col. (2)+ Col. (8)	Col. (6)+ Col. (7)	MONTHS OF EXPOSURE	
			Wounds (4)	Illness (5)	Total (6)			For Monthly Rate (9)	For Yearly Rate (10)
(1)									
1	17	17
2	1	...	...	...	...	1	1	17	17
3	16	16
4	...	1	...	1	1	...	1	16	16
5	...	1	...	...	...	1	1	15	16
6	14	15
7	...	1	...	...	...	1	1	14	15
8	13	14
9	...	2	...	...	...	2	2	13	14
10	11	12
11	1	1	...	1	11	12
12	10	12
13	...	1	...	...	...	1	1	10	10
14	...	1	...	...	...	1	1	9	9
15	3	1	...	...	...	3	3	8	8
16	...	1	...	...	...	1	1	5	5
17	4	4
18	4	4
19	4	4
20	4	4
21	1	...	...	...	...	1	1	4	4
22	3	3
23	3	3
24	1	...	...	...	...	1	1	3	3
25	...	1	...	...	...	1	1	2	2
26	1	...	...	...	...	1	1	1	1
27
28
29
...	7	8	...	2	2	15	17	231	240

Table XI gives the resulting monthly death-rates per 1,000 exposed to risk for each group of ages, distinguishing, as before, the rates from wounds, from other causes, and from all causes combined. Column 2 gives the months of exposure as obtained in Table X; columns 3, 4 and 5 show the corresponding deaths, whilst in columns 6, 7 and 8 are given the monthly death-rates.

TABLE XI.
Assured Yeomanry and Volunteers.

SELECT.

Age	1ST MONTH OF EXPOSURE				2ND MONTH OF EXPOSURE				3RD MONTH OF EXPOSURE				4TH MONTH OF EXPOSURE					
	E	DIED	Wounds	Illness	Total	Wounds	Illness	Total	E	DIED	Wounds	Illness	Total	E	DIED	Wounds		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(2)	(3)	(4)	
17-22	7,826	1	2	3	·128	·256	·383	7,742	1	6	7	·129	·775	·904	·771	·771	·904	
23-27	6,854	...	8	8	...	1·167	6,776	...	12	12	4	...	...	1·512	1·512	1·512	1·512	
28-32	2,674	...	2	2	...	·748	2,645	...	1·510	1	1	2	·662	·662	1·325	1·325	1·325	1·325
33-37	1,550	...	...	2	...	...	7·117	7·117	276	...	1	1	...	11·494	11·494	...	...
38-42	281	...	2	2	...	...	...	87	17	...	1	1	...	...	...	...	...	...
43-47	87	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
48 upwards	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	19,239	1	14	16	·052	·727	·778	19,053	2	25	27	·105	1·312	1·417	1·417	1·417	1·417	1·417

TABLE XI (continued).
Assured Yeomanry and Volunteers.

SELECT.

Ages	6TH MONTH OF EXPOSURE						6TH MONTH OF EXPOSURE					
	E			Monthly Death-Rate per 1,000			E			Died		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
17-22	6,765	3	24	27	·448	3·548	3·991	6,678	6	14	20	·998
23-27	6,221	8	23	31	1·286	3·697	4·933	6·35	3	16	19	·489
28-32	2,467	2	13	15	·811	5·270	6·080	2,493	2	2	4	·822
33-37	1,407	1	1	2	·711	1·421	1·388	2	1	3	1·431	·715
38-42	262	..	1	1	1	12·346	3·817	260	..	..	..	..
43-47	81	1	...	1	1	...	...	80	...	..	..	..
48 upwards	15	...	...	...	...	...	...	14	...	..	..	..
...	17,218	15	62	77	·871	3·601	4·472	16,998	13	33	46	·765
7TH MONTH OF EXPOSURE												
17-22	6,541	5	6	11	·764	·917	1·682	6,461	7	12	19	1·083
23-27	6,033	8	12	20	1·326	1·989	3·315	5,951	7	6	13	1·176
28-32	2,398	1	4	5	·417	1·668	2·085	2,366	2	1	3	·845
33-37	1,382	3	1	4	2·171	·724	2·894	1,861	4	2	6	2·999
38-42	257	1	...	1	3·891	...	3·891	254	..	..	..	...
43-47	80	...	...	...	...	...	...	79	..	13	..	...
48 upwards	14	...	...	...	...	...	...	...	..	..	..	...
...	16,705	18	23	41	1·078	1·377	2·454	16,485	20	21	41	1·213
8TH MONTH OF EXPOSURE												
17-22	6,541	5	6	11	·764	·917	1·682	6,461	7	12	19	1·083
23-27	6,033	8	12	20	1·326	1·989	3·315	5,951	7	6	13	1·176
28-32	2,398	1	4	5	·417	1·668	2·085	2,366	2	1	3	·845
33-37	1,382	3	1	4	2·171	·724	2·894	1,861	4	2	6	2·999
38-42	257	1	...	1	3·891	...	3·891	254	..	..	..	...
43-47	80	...	...	...	...	...	...	79	..	13	..	...
48 upwards	14	...	...	...	...	...	...	...	..	..	..	...
...	16,705	18	23	41	1·078	1·377	2·454	16,485	20	21	41	1·213

TABLE XI (continued).
Assured Yeomanry and Volunteers.

SELECT.

Age	9TH MONTH OF EXPOSURE				10TH MONTH OF EXPOSURE				11TH MONTH OF EXPOSURE				12TH MONTH OF EXPOSURE				
	E	Wounds	Died	Illness	Monthly Death-Rate per 1,000				E	Wounds	Died	Illness	Total	Wounds	Died	Illness	Total
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
17-22	6,365	6	19	25	·948	2·985	3·928	6·284	1	27	28	·160	4·381	4·492	4·044	4·038	5·048
23-27	5,865	3	4	7	·512	·683	1·196	5·745	6	23	29	·879	4·396	5·275	3·719	3·823	5·579
28-32	2,824	2	6	8	·861	2·582	3·442	2·275	2	10	12	3	2·311	2·311	1·646	1·646	2·469
33-37	1,386	3	4	7	2·246	2·994	5·240	1·288	···	1	1	2	4·149	4·149	8·289	8·289	...
38-42	251	...	...	...	...	...	...	241	1	...	...	...	...	...	...	...	...
43-47	79	...	...	...	...	...	...	77	...	...	...	...	...	...	...	...	...
48 upwards	13	...	...	...	...	...	...	11	...	...	...	...	...	...	...	...	...
...	16,223	14	33	47	·863	2·034	2·897	15·881	10	64	74	·630	4·030	4·660	4·030	4·030	4·660
10TH MONTH OF EXPOSURE																	
17-22	6,040	4	25	29	·662	4·139	4·801	5·917	6	35	41	1·014	5·915	6·929	4·065	4·065	5·543
23-27	5,549	3	19	22	·541	3·424	3·965	5·412	8	22	30	1·478	3·719	5·579	1·860	1·860	3·719
28-32	2,202	4	3	7	1·817	1·362	3·179	2·151	4	8	12	·823	1·646	2·469	...	...	...
33-37	1,250	1	4	5	·800	3·200	4·000	1·215	1	2	3	...	...	...	...	...	...
38-42	237	...	1	1	...	4·219	4·219	2·82	...	...	...	...	...	...	...	...	...
43-47	75	...	1	1	...	...	90·909	70	...	...	...	...	...	...	...	...	...
48 upwards	11	...	1	1	...	...	90·909	10	...	...	...	...	...	...	...	...	...
...	15,864	12	53	65	·781	3·450	4·231	15·007	19	67	86	1·266	4·465	5·731	4·465	4·465	5·731

SELECT.

TABLE XI (continued).
Assured Yeomanry and Volunteers.

Ages	13TH MONTH OF EXPOSURE						14TH MONTH OF EXPOSURE						15TH MONTH OF EXPOSURE						16TH MONTH OF EXPOSURE									
	DIED			MONTHLY DEATH-RATE PER 1,000			DIED			MONTHLY DEATH-RATE PER 1,000			DIED			MONTHLY DEATH-RATE PER 1,000			DIED			MONTHLY DEATH-RATE PER 1,000						
	E	Wounds (8)	Illness (9)	Total (6)	Wounds	Illness	Total (8)	E	Wounds (3)	Illness (4)	Total (6)	Wounds	Illness	Total (8)	E	Wounds (3)	Illness (4)	Total (6)	Wounds	Illness	Total (8)	E	Wounds (3)	Illness (4)	Total (6)			
(1)	(2)							(2)							(2)													
17-22	5,721	7	7	14	1,224	1,224	2,447	3,765	5	7	12	1,328	1,859	3,187	3,758	2	13	15	578	4,387	3,026	3,026	3,026	3,026	3,026			
23-27	5,209	6	31	37	1,152	5,951	7,103	3,459	2	13	15	578	4,387	3,187	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026	3,026		
28-32	2,063	2	6	8	969	2,908	3,878	1,322	...	4	4	4,115	4,115	4,115	4,115	4,115	4,115	4,115	4,115	4,115	4,115	4,115	4,115	4,115	4,115
33-37	1,155	3	1	4	2,597	866	3,463	729	...	3	3	
38-42	225	...	2	2	...	8,889	8,889	139	45	
43-47	67	...	...	...	...	...	...	...	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
48 upwards	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	14,450	18	47	65	1,246	3,253	4,498	9,468	7	27	34	739	2,852	3,591	

TABLE XI (continued).
Assured Yeomanry and Volunteers.

SELECT.

Age	17TH MONTH OF EXPOSURE						18TH MONTH OF EXPOSURE						20TH MONTH OF EXPOSURE							
	E		DIED		Wounds		E		DIED		Wounds		E		DIED		Wounds			
	(1)	(2)	Wounds	Illness	Total	(4)	(5)	(6)	Wounds	Illness	Total	(8)	(2)	(3)	(5)	(6)	Wounds	Illness	Total	(8)
17-22	851	...	2	2	2	...	2	2	2,350	601	...	...	515	2	2	2	3,884	1,838	3,884	3,676
23-27	961	...	1	1	1	...	1	1	1,041	690	...	...	544	1	1	1	1,838	1,838	1,838	...
28-32	431	...	1	1	1	...	1	1	2,320	300	...	...	244	...	...	...	...	...	...	...
33-37	222	...	...	...	...	...	...	...	...	163	...	...	139	...	...	...	...	...	...	...
38-42	63	...	...	...	...	...	...	...	...	51	...	...	44	...	...	...	...	...	...	...
43-47	27	3	...	8	11	11	...	...	111	111	20	...	16	1	1	1	62,500	...	62,500	...
48 upwards	4	...	...	...	...	...	...	...	...	4	...	...	4	...	...	...	...	...	...	...
...	2,559	3	4	7	11	172	1,563	2,735	1,829	...	...	2	2	2	2	...	1,093	1,093	1,093	...
19TH MONTH OF EXPOSURE																				
17-22	546	...	1	1	1	...	1	1	...	1,672	1,672	515	2	1	1	2	3,884	1,838	3,884	3,676
23-27	698	...	1	1	1	...	1	1	...	3,754	3,754	244	...	...	...	...	...	...	...	...
28-32	265	...	...	...	...	...	...	...	...	...	...	139	...	...	...	...	...	...	...	...
33-37	145	...	...	...	...	...	...	...	...	...	...	44	...	...	...	...	...	...	...	...
38-42	46	...	...	...	...	...	...	...	...	...	...	16	1	1	1	...	...	...	...	...
43-47	17	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...
48 upwards	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	1,621	...	2	2	2	...	1,234	1,234	1,506	4	1	5	2,656	...	...	...	...	...	...	...

TABLE XI (continued).
Assured Yeomanry and Volunteers.

SELECT.

Ages	21ST MONTH OF EXPOSURE						22ND MONTH OF EXPOSURE						23RD MONTH OF EXPOSURE						24TH MONTH OF EXPOSURE					
	DIED			MONTHLY DEATH-RATE PER 1,000			DIED			MONTHLY DEATH-RATE PER 1,000			DIED			MONTHLY DEATH-RATE PER 1,000			DIED			MONTHLY DEATH-RATE PER 1,000		
	E	Wounds	Illness	(5)	(6)	(7)	E	Wounds	Illness	(8)	(9)	(10)	E	Wounds	Illness	(11)	(12)	(13)	E	Wounds	Illness	(14)	(15)	(16)
(1)	(2)	(3)	(4)				(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
17-22	496	1	1	2	2,016	2,016	4,032	475	...	1	1	1	416	1	1	2	2,404	2,404	4,808	4,808	2,227	2,227	4,878	4,878
23-27	519	1	1	2	4,184	4,184	8,368	500	...	...	...	...	449	1	1	1	4,878	4,878	...	...	...	...	...	...
28-32	1	1	1	2	7,463	7,463	126	230	...	2	2	2	109	...	...	...	...	...	...	...	...	...	...	...
33-37	184	...	1	1	...	...	...	126	...	...	...	...	39	...	...	...	...	...	...	...	...	...	...	...
38-42	43	...	...	...	...	...	...	...	...	...	...	...	14	...	...	...	...	...	...	...	...	...	...	...
43-47	14	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...
48 upwards	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	1,449	2	3	5	1,380	2,070	3,451	1,387	...	3	3	3	...	...	...	3	2,163	2,163	2,163	2,163	2,163	2,163	2,163	2,163
22ND MONTH OF EXPOSURE						23RD MONTH OF EXPOSURE						24TH MONTH OF EXPOSURE						21ST MONTH OF EXPOSURE						
17-22	440	...	...	...	...	...	...	...	...	...	...	...	416	1	1	2	2,404	2,404	4,808	4,808	2,227	2,227	4,878	4,878
23-27	472	...	...	...	...	...	...	...	...	...	...	...	449	1	1	1	4,878	4,878	...	...	...	...	...	...
28-32	221	...	...	...	...	...	...	...	...	...	...	...	205	1	1	1	4,878	4,878	...	...	...	...	...	...
33-37	116	...	2	2	...	...	...	17,241	17,241	...	...	...	109	...	...	...	...	...	...	...	...	...	...	...
38-42	39	...	...	...	...	...	...	...	...	...	...	...	36	...	...	...	...	...	...	...	...	...	...	...
43-47	13	...	...	...	...	...	...	...	...	...	...	...	13	...	...	...	...	...	...	...	...	...	...	...
48 upwards	3	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...
...	1,304	...	2	2	...	...	...	1,534	1,534	...	...	...	1,231	2	2	2	1,625	1,625	3,249	3,249	2,227	2,227	4,878	4,878

TABLE XI (continued).
Assured Tenant and Volunteers.

SELECT.

Age ^s	25TH MONTH OF EXPOSURE				26TH MONTH OF EXPOSURE				27TH MONTH OF EXPOSURE				28TH MONTH OF EXPOSURE				
	DIED		MONTHLY DEATH-RATE PER 1,000		DIED		MONTHLY DEATH-RATE PER 1,000		DIED		MONTHLY DEATH-RATE PER 1,000		DIED		MONTHLY DEATH-RATE PER 1,000		
	E	Wounds (3)	Wounds (4)	Total (5)	Illness (6)	Total (7)	E	Wounds (2)	Wounds (3)	Total (6)	Illness (4)	Total (5)	E	Wounds (2)	Wounds (3)	Total (6)	
(1)																	
17-22	397	...	1	2	...	2,519	161	...	2	1	...	12,422	12,422	...	...	...	...
23-27	422	...	1	2	...	4,739	147	...	1	1	...	6,803	6,803	...	...	...	...
28-32	189	...	1	1	...	9,434	75	...	...	...	...	13,333	13,333	...	...	...	...
33-37	106	...	1	1	...	...	40	...	...	...	...	...	...	...	...	...	...
38-42	31	...	1	1	...	...	10	...	...	5	...	...	...	...	...	...	...
43-47	12	...	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...
48 upwards	2	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...
...	1,159	...	4	4	...	3,451	439	...	4	4	...	9,112	9,112	...	...	...	...
17-22	122	...	...	...	...	...	...	...	...	...	...	50	...	...	...	...	...
23-27	120	...	...	...	...	...	...	...	...	...	...	61	...	...	...	...	...
28-32	60	...	...	...	...	...	...	...	...	...	...	34	...	...	...	...	...
33-37	27	...	...	...	...	...	...	...	...	...	...	11	...	...	...	...	...
38-42	8	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...
43-47	4	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...
48 upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	341	...	...	...	...	...	...	...	...	...	...	161	...	...	...	...	...

TABLE XI (continued).

Assured Yeomanry and Volunteers.

SELECT.

Ages (1)	E	29TH MONTH OF EXPOSURE					
		DIED			MONTHLY DEATH-RATE PER 1,000		
		Wounds (3)	Illness (4)	Total (5)	Wounds (6)	Illness (7)	Total (8)
17-22	2	...	...	...	...	...	...
23-27	3	...	...	...	...	...	...
28-32	2	...	...	...	...	...	...
33-37	2	...	...	...	...	...	...
38-42	...	...	...	...	...	...	...
43-47	...	...	...	...	...	...	...
48 upwards	...	...	...	...	...	...	...
...	9	...	...	...	...	...	...

Tables XII and XIII summarize the facts given in Table XI, the former combining all months, and showing total results for each age group, and the latter combining all ages and showing total results for each policy month.

Referring to Table XII, and omitting the rates for ages beyond 42, where the facts are too few to enable us to draw any conclusions, we notice that the death-rate from wounds appears, as might be expected, on the whole to remain about the same for all ages, the tendency, perhaps, being slightly to increase with the age. Looking at column 10, giving the death-rates from "Other Causes", we see again that the age distribution has, on the whole, very little effect, except for the group 23 to 27, where a comparatively high rate is shown.

It will be remembered that about this age period most of the well-known tables of mortality show an apparently abnormal increase in the death-rates. It is possible that the same force which produced this result in other tables has operated to predispose those engaged in the war to fall more ready victims to disease, or to be less able to overcome it when attacked. In marked contrast to this there is a correspondingly low rate for ages 33 to 37, and it may be that the inference to be drawn here is that men of these ages have more power to resist the inroads of disease, or that they exercise greater discretion in their dietary.

TABLE XII.

Assured Yeomanry and Volunteers.

SUMMARY.

ENTERED	(17-22)	.	7,826
	(23-27)	.	6,854
	(28-32)	.	2,674
	(33-37)	.	1,530
	(38-42)	.	281
	(43-47)	.	87
	(48 and upwards)	17	
			<u>19,269</u>

SELECT.

ALL DURATIONS COMBINED.

Ages	Existing	Left Active Service or otherwise withdrew from observation	DIED			Col. (2) + Col. (3)	Months of Exposure	MONTHLY DEATH-RATE PER 1,000			
			Wounds	Illness	Total			Wounds	Illness	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
17-22	.	2,886	4,628	69	243	312	7,514	100,538	.686	2.417	3.103
23-27	.	1,922	4,612	67	253	320	6,534	92,548	.724	2.734	3.458
28-32	.	652	1,906	27	89	116	2,558	36,862	.732	2.414	3.146
33-37	.	386	1,085	20	39	59	1,471	20,876	.958	1.868	2.826
38-42	.	52	215	3	11	14	267	4,090	.733	2.689	3.422
43-47	.	18	61	7	1	8	79	1,305	5.364	.766	6.130
48 & upwards	7	8	...	2	2	2	15	231	...	8.658	8.658
		5,923	12,515	193	638	831	18,438	256,450	.753	2.488	3.241

TABLE XIII.
Assured Yeomanry and Volunteers.

SUMMARY.

SELECT.

ALL AGES COMBINED.

Month of Exposure (n) (1)	E (2)	DIED			MONTHLY DEATH-RATE PER 1,000		
		Wounds (3)	Illness (4)	Total (5)	Wounds (6)	Illness (7)	Total (8)
1	19,269	1	14	15	.052	.727	.779
2	19,053	2	25	27	.105	1.312	1.417
3	18,592	12	54	66	.645	2.904	3.549
4	17,843	17	60	77	.964	3.401	4.365
5	17,218	15	62	77	.871	3.601	4.472
6	16,998	18	33	46	.765	1.941	2.706
7	16,705	18	23	41	1.078	1.377	2.455
8	16,485	20	21	41	1.213	1.274	2.487
9	16,223	14	33	47	.863	2.034	2.897
10	15,881	10	64	74	.630	4.030	4.660
11	15,364	12	53	65	.781	3.450	4.231
12	15,007	19	67	86	1.266	4.465	5.781
13	14,450	18	47	65	1.246	3.253	4.499
14	9,468	7	27	34	.739	2.852	3.591
15	8,407	4	16	20	.476	1.903	2.379
16	4,692	...	12	12	...	2.558	2.558
17	2,559	3	4	7	1.172	1.563	2.735
18	1,829	...	2	2	...	1.093	1.093
19	1,621	...	2	2	...	1.284	1.284
20	1,506	4	1	5	2.656	.664	3.320
21	1,449	2	3	5	1.380	2.070	3.450
22	1,387	...	3	3	...	2.163	2.163
23	1,304	...	2	2	...	1.534	1.534
24	1,231	2	2	4	1.625	1.625	3.250
25	1,159	...	4	4	...	3.451	3.451
26	439	...	4	4	...	9.112	9.112
27	341	...	...	...	...	...	...
28	161	...	...	...	...	...	...
29	9	...	...	...	...	...	...
...	256,450	193	638	831	.753	2.488	3.241

The rates given in Table XIII for all classes combined are reproduced in the form of curves in Diagram F, which accordingly shows us the death-rates for all ages combined for each policy month, and enables us to trace more closely the effect of length of service. The exposures beyond the 24th month were so few that the corresponding rates have not been reproduced. Taking first the curves for "All Causes Combined", we see that for the first year of assurance the rate tended to increase, reaching a maximum at the end of that period. In the second year it declined, rising only to a much lower maximum towards the end.

In considering this curve it is to be noted that the average dates at which the assurances were effected were in the early part of calendar years ; so that the end of a policy year, that is the 12th and 24th month, would fall roughly about the time of the South African summer, when, as already stated, we might expect a heavy death-rate from disease. When this is borne in mind it makes the fall in the general death-rate as the duration increases more noticeable.

It will be observed, moreover, that this fall is occasioned entirely by the lower death-rates experienced from "Other Causes", the rates for wounds remaining fairly even up to the end of the 17th or 18th month, and afterwards rising only slightly.

From this we might fairly assume that the duration of the policy, or rather the length of the period for which the men were engaged upon active service, had an important bearing on the death-rate—a bearing more important than that of age. It may be that this arose from the men becoming more inured to hardships, and better able to withstand disease, or it may be that it was from the less hardy men being invalidated home, and consequently being taken off the "exposed to risk." Probably both causes combined to produce the effect ; but at all events we may fairly argue from the diagram, that whilst the death-rates from wounds remained practically unaltered by lapse of time, those from disease diminished.

With the object of ascertaining, if possible, whether age had any appreciable effect on the death-rates from disease, a set of diagrams was prepared from Table XI, showing the curves for the respective age groups. These diagrams have not been reproduced in this paper, as the few facts brought out by them can be followed with little difficulty from a careful examination of Table XI, but we shall be pleased to show them to anyone interested in this part of the subject and desiring to pursue it further.

Dealing with death-rates from "Other Causes" the general results may be summarized as follows :

- (1) For the first six months of assurance, ages 23-27 and 38-42 show the highest death-rates.
- (2) From the 7th to the 12th month, ages 17-22 show particularly heavy death-rates.
- (3) From the 13th to the 15th month, ages 23-27 again take the first place.

(4) In the 16th and 17th month, ages 17-22 return to the unenviable position occupied by them in the 7th-12th months; but it must be borne in mind that the number of deaths here referred to is very small.

Beyond this period, the rates vary so considerably that no general deductions can be drawn from a comparison of the various age groups.

Generally, as might have been expected, it must be concluded that the age distribution had very little effect upon the death-rates, the incidents of the campaign and the length of the period of exposure being much more potent factors.

Table XIV gives the various columns required to obtain the single premium for an assurance for the 29 months of the war, the radix of the l_x column being taken in each age group as 100,000. Thus, column 2 gives the monthly death-rate per 1,000 as obtained in Table X; by successive multiplications into these rates, the deaths have been obtained as shown in column 4, and by successive subtraction from the living at the beginning of the previous month, the living for the succeeding month have been obtained.

Column 5 gives the number of deaths discounted for the successive months. The sum of this column for all months gives the total value, at the commencement of the risk, of the payments to be made, and by dividing by 100,000, the assumed number of entrants, the "Single Premium" for an assurance of £1 for the whole duration of the war is obtained. The method adopted provides for payments to be made at the end of the policy month in which death occurs, and hence the resulting single premiums may be taken to include the adjustment for "Immediate Payment of Claims."

TABLE XIV.

*Assured Yeomanry and Volunteers.**Table for obtaining Single Premiums from the Monthly Death-rate.*

SELECT.

INTEREST 3 PER-CENT.

Month of Exposure (n)	AGES 17-22				AGES 23-27			
	Monthly Death- rate per 1,000 from Table XI	l_x	d_x	$v^{\frac{n}{12}} d_x$	Monthly Death- rate per 1,000 from Table XI	l_x	d_x	$v^{\frac{n}{12}} d_x$
		(1)	(2)	(3)	(4)	(5)	(2)	(3)
1	.383	100,000	38	37.9	1.167	100,000	117	116.7
2	.904	99,962	90	89.6	1.771	99,883	177	176.1
3	3.207	99,872	320	317.6	3.909	99,706	390	387.1
4	4.168	99,552	415	410.9	4.704	99,316	467	462.4
5	3.991	99,137	396	391.2	4.983	98,849	493	487.0
6	2.995	98,741	296	291.7	3.097	98,356	305	300.5
7	1.682	98,445	166	163.2	3.315	98,051	325	319.4
8	2.941	98,279	289	283.4	2.185	97,726	213	208.8
9	3.928	97,990	385	376.6	1.196	97,513	117	114.4
10	4.492	97,605	438	427.3	5.048	97,396	492	480.0
11	4.801	97,167	467	454.5	3.965	96,904	384	373.7
12	6.929	96,700	670	650.5	5.543	96,520	535	519.4
13	2.447	96,030	235	227.6	7.103	95,985	682	660.5
14	3.187	95,795	305	294.7	4.337	95,303	413	399.0
15	.905	95,490	86	82.9	3.270	94,890	310	298.8
16	4.831	95,404	461	443.2	1.688	94,580	160	153.8
17	2.350	94,943	223	213.9	1.041	94,420	98	94.0
18	...	94,720	...	...	...	94,322	...	...
19	...	94,720	...	...	1.672	94,322	158	150.8
20	3.884	94,720	368	350.3	3.676	94,164	346	329.4
21	4.032	94,352	380	360.8	...	93,818	...	...
22	2.105	93,972	198	187.6	...	93,818	...	...
23	...	93,774	...	...	...	93,818	...	...
24	4.808	93,774	451	425.1	2.227	93,818	209	197.0
25	2.519	93,323	235	221.0	4.739	93,609	444	417.5
26	12.422	93,088	1,156	1,084.3	6.803	93,165	634	594.7
27	...	91,932	...	...	92,531	...	...	...
28	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...
...	...	...	8,068	7,785.8	...	...	7,469	7,241.0

TABLE XIV (continued).

Assured Yeomanry and Volunteers.

Table for obtaining Single Premiums from the Monthly Death-rate.

SELECT.

INTEREST 3 PER-CENT.

Month of Exposure (n)	AGES 28-32				AGES 33-37			
	Monthly Death-rate per 1,000 from Table XI	l_x	d_x	$v^{\frac{1}{12}} d_x$	Monthly Death-rate per 1,000 from Table XI	l_x	d_x	$v^{\frac{1}{12}} d_x$
(1)	(2)	(3)	(4)	(5)	(2)	(3)	(4)	(5)
1	748	100,000	75	74.8	...	100,000	...	...
2	1,512	99,925	151	150.3	1,325	100,000	132	131.4
3	2,683	99,774	268	266.0	3,392	99,868	339	336.5
4	5,163	99,506	514	509.0	2,102	99,529	209	207.0
5	8,080	98,992	602	594.6	1,421	99,320	141	139.3
6	1,644	98,390	162	159.6	2,146	99,179	213	209.9
7	2,085	98,228	205	201.5	2,894	98,966	286	281.1
8	1,268	98,023	124	121.6	4,409	98,680	435	426.5
9	3,442	97,899	337	329.6	5,240	98,245	515	503.7
10	5,275	97,562	515	502.5	2,311	97,730	226	220.5
11	3,179	97,047	309	300.7	4,000	97,504	390	379.6
12	5,579	96,738	540	524.3	2,469	97,114	240	233.0
13	3,878	96,198	373	361.2	3,463	96,874	335	324.4
14	3,026	95,825	290	280.2	4,115	96,539	397	383.5
15	4,188	95,535	400	385.5	3,008	96,142	289	278.5
16	...	95,135	...	...	2,506	95,853	240	230.7
17	2,320	95,135	221	211.9	...	95,613	...	...
18	3,333	94,914	316	302.3	...	95,613	...	...
19	3,754	94,598	355	338.8	...	95,613	...	...
20	...	94,243	...	...	...	95,613	...	...
21	8,368	94,243	789	749.2	7,463	95,613	714	678.0
22	...	93,454	...	...	15,873	94,899	1,506	1,426.6
23	...	93,454	...	...	17,241	93,893	1,610	1,521.3
24	4,878	93,454	456	429.8	...	91,783	...	...
25	...	92,998	...	...	9,434	91,783	866	814.3
26	13,333	92,998	1,240	1,163.1	...	90,917	...	...
27	...	91,758	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...
...	...	...	8,242	7,956.5	...	...	9,083	8,725.8

TABLE XIV (continued).

*Assured Yeomanry and Volunteers.**Table for obtaining Single Premiums from the Monthly Death-rate.*

SELECT.

INTEREST 3 PER CENT.

Month of Exposure (n)	AGES 38-42				AGES 43-47			
	Monthly Death- rate per 1,000 from Table XI	l_x	d_x	$v^{\frac{1}{12}} d_x$	Monthly Death- rate per 1,000 from Table XI	l_x	d_x	$v^{\frac{1}{12}} d_x$
(1)	(2)	(3)	(4)	(5)	(2)	(3)	(4)	(5)
1	7.117	100,000	712	710.2	...	100,000	...	...
2	3.623	99,288	360	358.2	11.494	100,000	1,149	1148.4
3	10.989	98,928	1,087	1079.0	11.765	98,851	1,163	1154.4
4	...	97,841	...	...	12.195	97,688	1,191	1179.3
5	3.817	97,841	373	368.4	12.346	96,497	1,191	1176.4
6	...	97,468	...	...	...	95,306	...	...
7	3.891	97,468	379	372.5	...	95,306	...	...
8	...	97,089	...	...	...	95,306	...	...
9	...	97,089	...	...	...	95,306	...	...
10	8.299	97,089	806	786.4	...	95,306	...	...
11	4.219	96,283	406	395.1	...	95,306	...	...
12	...	95,877	...	...	...	95,306	...	...
13	8.889	95,877	852	825.1	...	95,306	...	...
14	...	95,025	...	...	...	95,306	...	...
15	...	95,025	...	...	...	95,306	...	...
16	...	95,025	...	...	...	95,306	...	...
17	...	95,025	...	...	111.111	95,306	10,589	10154.7
18	19.608	95,025	1,863	1782.2	...	84,717	...	...
19	...	93,162	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...
...	...	...	6,838	6677.1	...	...	15,283	14808.2

TABLE XIV (continued).

*Assured Yeomanry and Volunteers.**Table for obtaining Single Premiums from the Monthly Death-rate.*

SELECT.

INTEREST 3 PER CENT.

Month of Exposure (n)	AGES 48 AND UPWARDS			
	Monthly Death-rate per 1,000 from Table XI	l_x	d_x	$v_x^n d_x$
(1)	(2)	(3)	(4)	(5)
1	...	100,000	...	...
2	...	100,000	...	...
3	...	100,000	...	...
4	62.500	100,000	6,250	6188.7
5	...	93,750	...	...
6	...	93,750	...	...
7	...	93,750	...	...
8	...	93,750	...	...
9	...	93,750	...	...
10	...	93,750	...	...
11	90.909	93,750	8,523	8295.2
12	...	85,227	...	...
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
...	14,773	14483.9

Table XV has been prepared to enable us to pass from single premiums to annual. The usual relation between single and annual premiums does not help us here. We are dealing with temporary assurances, payable immediately upon the occurrence of death, whereas the premiums are paid yearly in advance. Thus it will be seen that the single premium and the annuity do not correspond, and, to obtain the latter, it is more convenient to employ yearly rates of mortality.

TABLE XV.

Assured Yeomanry and Volunteers.

SELECT.

YEARLY DEATH RATES.

Ages	MONTHS OF ASSURANCE 1 TO 12				MONTHS OF ASSURANCE 13 TO 24			
	Months of Exposure to Risk	Years of Exposure to Risk =Col.(2) ÷ 12	Deaths during Period	Yearly Death Rates	Months of Exposure to Risk	Years of Exposure to Risk =Col.(6) ÷ 12	Deaths during Period	Yearly Death Rates
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
17-22	82,161	6,847	263	·038411	19,191	1,599	46	·028768
23-27	74,825	6,235	247	·039615	18,927	1,577	70	·044388
28-32	29,512	2,459	92	·037414	7,637	637	23	·036107
33-37	16,785	1,399	43	·030736	4,211	351	15	·042735
38-42	3,166	264	11	·041667	977	81	3	·037037
43-47	996	83	4	·048193	344	29	4	·137931
48 & upwards	176	15	2	·133333	61	5	...	...

Column 2 gives the months of exposure as found in Table XV, in which the deaths have been left in amongst the "Exposed", and subtracted only at the end of the 12th and 24th months.

Column 3, by dividing by 12, reduces the months of exposure to years, and the corresponding yearly rate of mortality is given in column 5.

In Table XVI the annuity-value is deduced from this yearly rate of mortality.

Table XVII is, perhaps, the most interesting table to those who have to deal with war mortality amongst assured lives. In column 2 is the single premium obtained from Table XIV as already described. Column 3 gives the annuity due from Table XVI, and finally, in column 4 is the annual premium for the risk incurred during the war by the assured lives.

TABLE XVI.
Assured Yeomanry and Volunteer's.
 ANNUITIES OBTAINED FROM YEARLY DEATH RATES.

SELECT.

INTEREST 3 PER-CENT.

Ages (1)	MONTHS OF ASSURANCE, 1 TO 12			MONTHS OF ASSURANCE, 13 TO 24			Col. (4) X Col. (7)	Col. (5) X Col. (8)	Col. (6) X Col. (9)	Col. (7) X Col. (10)
	Yearly Death Rate from Table XV = q_x (2)	$p_x = 1 - q_x$ (3)	v_{2x} (4)	Yearly Death Rate from Table XV = q_x (5)	$p_x = 1 - q_x$ (6)	v_{2x} (7)				
17-22	•	•038411	•961589	•933558	•028768	•971232	•94294	•88031	•36680	1.30038
23-27	•	•0599615	•960385	•93241	•044388	•955612	•92778	•86507	•36045	1.29286
28-32	•	•057414	•962586	•93455	•036107	•963883	•93582	•87457	•36440	1.29895
33-37	•	•030736	•969264	•94103	•042735	•957265	•92998	•87457	•36440	1.30543
38-42	•	•041667	•955333	•93042	•037037	•962963	•93492	•86987	•36245	1.29287
43-47	•	•048193	•9511807	•92408	•137931	•862039	•83696	•77342	•32226	1.24634
48 and upwards		•133333	•866867	•84142	...	1.00000	•97087	•81691	•34038	1.18180

TABLE XVII.

Assured Yeomanry and Volunteers.

SINGLE AND ANNUAL PREMIUMS.

SELECT.

INTEREST 3 PER-CENT

Ages (1)	Single Premium per £100 from Table XIV (2)	$1 + a_{x; \frac{5}{12}}$ from Table XVI (3)	Annual Premium per £100 Col. (2) \div Col. (3) (4)
17-22. . .	7.7858	2.30038	3.38457
23-27. . .	7.2410	2.29286	3.15806
28-32. . .	7.9565	2.29895	3.46093
33-37. . .	8.7258	2.30643	3.78489
38-42. . .	6.6771	2.29287	2.91211
43-47. . .	14.8082	2.24634	6.59216
48 and upwards .	14.4839	2.18180	6.63851

With regard to this annual premium, it may be observed that it is obtained by the use of an annuity covering a period of $2\frac{5}{12}$ years only. Strictly, therefore, the last premium charged should be only $\frac{5}{12}$ of that given in column 4. In practice, however, such a procedure would be impossible, as five months before the cessation of hostilities there was no means of estimating how long the operations would last. By charging the full annual premium, and returning $\frac{7}{12}$ (the proportion not required) on the declaration of peace, this difficulty is overcome. This was the method adopted in practice by many Offices charging extra premiums for war risk.

As has been previously remarked, the results for age 43 and upwards are deduced from so small an experience as to render them of little value, and although the premiums brought out vary considerably for the other age groups, it is not suggested for one moment that varying premiums ought to be charged to cover the risk of war.

In looking at these premiums it should also be remembered that although the experience includes a proportion of officers, the vast majority of the lives observed were non-commissioned officers and men. The rates for officers considered alone would no doubt be much higher.

Although the premiums are probably unsuitable as a basis for the calculation of any extra premium required for an officer in the Regulars, they are, we think, valuable should similar auxiliary forces be required in any future war—a not improbable contingency.

It may be thought by some that we have gone into unnecessary detail in this investigation; that for the purpose of arriving at approximate premiums we have taken undue trouble in verifying the facts upon which they are based. It has not been, however, the only object of this paper to arrive at monetary results, but as the title indicates, it is an attempt to investigate as accurately as possible the mortality experienced by the Imperial Forces during the late war, in the hope that some useful information may be derived from the discussion of the various points brought out, and if one of the results has been to confirm in a measure prevailing ideas amongst the actuarial profession on the subject of the incidence of war risks, the paper will have served a useful purpose.

During the progress of the investigation over 40,000 cards were written, involving very great labour. So far as we are aware, no other war statistics have ever been obtained in a similar manner, as it was impossible for previous investigators to enter into detail in the way in which we happily have been enabled to do. As explained in the early portion of the paper, we were able, by the courtesy of the War Office, to obtain the strength of the forces engaged at very frequent intervals, and every death recorded was closely examined; whilst the assured experience may be said to have been dealt with in much the same way as Tables of Mortality deduced from the general records of assured lives.

We have had to follow closely the progress of the war, and have been much impressed by many features which prove how difficult must have been the task before our generals and home authorities. In the first place, it will be noticed how the strength of the forces was maintained, necessitating a constant flow of reinforcements to replace the inevitable wastage of war, proving that those in authority never lost sight of the importance of this point, and never allowed it to get out of hand, although the base of operations was 6,000 miles away. In the next place, it has been strongly brought home to us that the care of the sick and wounded was exceptionally good. Although the medical staff were put to very severe tests on many occasions, they were always equal to any emergency, whether caused by disease or by the bullets of the enemy.

We cannot close without expressing our admiration for the endurance and courage exhibited by all arms throughout the war, and a feeling of thankfulness that a combat under circumstances of exceptional difficulty with so brave and stubborn a foe has been brought to a successful termination.

DISCUSSION.

Mr. A. G. MACKENZIE felt certain that on no previous occasion had results from any campaign or war been treated in so scientific and thorough a manner, and he was sure that the paper would long have a high place in the estimation of all interested in mortality statistics. The manner in which the authors had treated the results in the form of diagrams was particularly informing, and showed very graphically the results obtained. It was interesting to learn from the paper that the mortality experience in the late war was at a lower rate than had been experienced in any of the great wars of the past century, and it was especially gratifying to learn that the mortality from disease was less than might have been anticipated. That, he thought, was owing to the great skill and organisation of the medical forces. One thing which had particularly struck him was that the premiums which were supposed to be adequate when fixed by the offices did not appear to have been sufficient. The mortality experienced by the officers of the regular forces during the first year of the war, appeared to have been about 8 per-cent., whereas the premium which was generally quoted for the extra risk was five guineas. Afterwards the rate of mortality was about 4 per-cent., and the premiums which were generally charged were, he believed, two guineas; so that it would appear as if the offices had charged just about 50 per-cent. of what was really required. Under those circumstances, it was somewhat curious to hear that there had been many applications made by officers returned from the front for some return of extra premiums. It was rather difficult for anyone who had not been trained as an actuary to understand that the matter must be looked at from the broad standpoint of average, and that it was impossible to go into particulars as regards individuals as to whether there had been gain or loss in any one transaction. Even if it had been proved that the amounts charged were more than sufficient to provide for the risk which really occurred, the question of the return of premiums would be one-sided, because the companies would have had no power to call for any additional premiums in the contrary event of the experience having been more unfavourable than was anticipated, and the question of the deterioration of health which might possibly affect the longevity of the assured, must also be taken into consideration. There had been a general feeling among many officers that companies, from patriotic motives, ought to waive all extra premiums. That, of course, would undoubtedly be unfair to the other policyholders in the companies, who would have to stand the brunt of the extra charge which had to be made. He thought one suggestion might be considered by the authorities, namely, whether it would not be practicable, considering the circumstances of officers, to provide in some degree for the extra premiums which they might have to pay on account of being called upon to take up military duties. He thought it would be well if offices were to impress upon officers generally, when they took out policies, the advisability of paying a small extra premium each year to cover the risk of war. That plan, he believed, was arranged on a very moderate scale at present by a large number of offices, the premiums varying from 10s. per-cent. upwards. If offices generally were to consider, in the face of the mortality experience and the results of the

last and of other campaigns, what extra premium might be supposed to be adequate, and were to come to some arrangement in regard to that matter, he thought it would be very valuable. It would also be of interest if the offices would in combination consider what had been the result to themselves of the extra war mortality, comparing and combining their experience as to the amount which was paid for the risk and the actual loss which they had suffered. He thought the Government might take an example from bankers, commercial establishments, and even some insurance companies, and consider whether, for policies for a certain amount, they could not see their way to paying the extra premium which was asked for the purpose. He did not think the taxpayers would object to that. The tax would fall properly upon the nation, and not upon the policyholders in particular offices ; and he certainly hoped on the next occasion—which they all hoped would be far distant—when British soldiers and civilians had to take up arms for the defence, or in the interests, of their country, some provision of that kind would be made.

Surgeon-General W. F. STEVENSON, M.B., C.B., said he was afraid he was unable to add anything to this most interesting paper, which he was sure would be of very great value to everybody interested in the matter. Having, together with some other gentlemen who were present, had something to do with the statistics of the war, he knew the paper would be found of the greatest possible value to them. He desired to say how very much the service to which he had the honour to belong would appreciate one or two remarks made in the paper, especially towards the end of it. Such remarks would be greatly appreciated by his Department, because such tokens of appreciation had been wanting recently on many occasions, and he therefore desired, on the part of the officers of the Medical Service, to thank the authors for the remarks they had made in that respect.

Mr. W. A. WORKMAN thought the paper was so complete in every detail that it was almost above criticism, but he desired to offer a few remarks on some of the points which had been brought out. An interesting point was the difference between the proportion of the officers to the men amongst the Yeomanry and Regulars. It was stated on page 6 that in the Yeomanry and Colonial forces the proportion of officers to men was almost $1\frac{1}{2}$ times as large as the proportion in the Regulars. On turning to Table III, and finding that the death-rate among the officers of the Yeomanry was very much greater than the death rate among the officers in the Regulars, the question arose, did the difference in the distribution account for some of the difference in the mortality? The view that it did was rather strengthened by the fact that the death-rate from disease was practically the same among officers of the Yeomanry as among officers of the Regulars, and yet the death rate from wounds was very much higher in the one case than in the other. As an illustration, supposing there were two bodies of men, each numbering 1,000, where the proportion of officers in the one was very much larger than the proportion of officers in the other,—Did that difference in the distribution increase the risk officers ran? There was no doubt, in considering the death-rate among the general body of troops, it did do so, because where there was a larger proportion of men running a

bigger risk, there must necessarily be a larger death-rate among the whole body. The same argument of course applied to the Colonial forces, where the distribution between officers and men was much the same as it was in the Yeomanry, but seeing that the death-rate there was so much less than in the Regulars, it seemed to point to the fact that the immunity from death and disease, owing to acclimatisation and knowledge of the country, was even greater than that shown by the figures at first glance. In regard to the medical opinion given on page 21 to the effect that a cold had so much more serious effects in South Africa than in this country, that seemed to raise the question as to whether English offices were justified in charging ordinary home rates for civilians living in South Africa. Of course, as a set off to the increased risk named, offices had the great benefit derived from a climate in which people were so little likely to develop lung complaints, and he presumed if the one was set against the other there was a balance on the right side. One item of general interest to the public in the paper, was the proving of the idea that the Colonials being acclimatised and having a knowledge of the country, would undergo a much less death-rate than the ordinary troops. This was, he thought, established beyond doubt in the paper.

Lieut.-Col. E. M. WILSON, C.B., C.M.G., D.S.O., having, in the first place, thanked the authors and Mr. Mackenzie for the very kind words in which they had spoken of the medical department, referred to the part of the paper where the authors spoke of the pause at Bloemfontein being accompanied by an increased death-rate. That was not at all an uncommon thing. He thought it was very largely due to the inactivity which was imposed upon men who had lately gone through very severe experiences. It was very often found that the death-rate during the most severe portions of the campaign was not so heavy as that which followed a period of forced inactivity. The authors had stated, with reference to the mortality among officers and men, that it was possible the officers were better looked after when they were ill. He hoped that was not so, and believed it was not the case. The statement made, that troops which had been in the country longer suffered less was undoubtedly true. When Lord Kitchener went up the Nile during the first part of the war, there was one brigade of four infantry regiments employed, but before the advance to Khartoum was made, another brigade of four additional battalions was also employed, and when a comparison was made between the death-rate among those two brigades the difference was exceedingly marked. The first brigade—he would not say because it was largely composed of Highlanders—suffered very little; but the second brigade, which had only lately come from England, suffered very much more severely. With regard to enteric fever, that had been endemic in South Africa as long as he had known the country, and during the Zulu War it was very serious. If the authors could tabulate the returns of deaths from disease in the Zulu War of 1879, especially from enteric fever, and compare them with those in the late war, it would be seen that the medical profession had learned something during the last twenty years, because the death-rate of the two campaigns was very materially different.

Mr. S. G. WARNER considered that no war statistics had hitherto

been treated in so elaborately scientific a manner. As the authors had explained, a great deal of valuable information, which was essential, had been most courteously placed at their disposal by the War Office; but having obtained that material they had worked upon it with an ingenuity and diligence which had produced what would take rank for a long time as the most scientific treatment of such a subject on record. But, following on that, the chief impression left on his mind by such a paper was, how very much any such great historical event as the South African War must, for statistical purposes, be considered unique. It possessed features so individual and peculiar to itself that one doubted how far it would be of practical use in other similar events. The war had been distinguished by several outstanding features quite its own. The great mortality from disease, for instance, occurred to the mind at once. Such characteristics were not likely to occur in the same way in another war. It seemed to him that one of the leading lessons of the paper was that each such phenomenon would have to be analyzed by itself on its own merits, and it was very doubtful how far one would throw light upon the other. He was also impressed by the cognate and consequent fact of the arbitrary character of "war extras." Of course, that was inevitable; they had to be decided upon quickly, without much notice, and with a very slender basis of fact to go upon. It seemed to him that offices would always be, for the reasons he had just expressed, more or less in the dark in fixing extra rates for any individual war. Another aspect of the matter, which had been referred to by a previous speaker, was suggestive and interesting in the light of the fact that the late campaign was the first practical experience of war on a large scale since the growth of the practice of charging uniform extras, either during military service or during life. As a matter of fact that was now very freely done. Proposers who were officers in the Army or Navy had appreciated, and acted on, the principle of paying moderate fixed extra premiums throughout life, which should cover all risks of foreign service or war, at a somewhat higher rate fixed in the same way to endure as long as service lasted. If such a system became universal, it would give an entirely different aspect to statistical investigations of war experience, so far as extra premiums were concerned. Offices would no longer be interested in fixing the extra premium for each individual campaign, and he could not but think that that would be an advantage. Probably, having regard to the larger body of facts involved in the computation of extras on such a principle, experience would eventually lead to figures being arrived at which would approximately represent the real risk run. This could hardly be hoped for as regards the extras charged for individual wars, for there they were extremely unlikely to hit upon the right amount. On the whole, therefore, he hoped the practice of charging uniform extras would in time so prevail that offices would no longer be concerned on any great scale in fixing beforehand in a hurry, and with very imperfect data to guide them, what was likely to be an adequate extra premium for a particular campaign.

Mr. A. F. BURRIDGE thought the late war was unique in regard to the experience of life assurance offices in the respect that, for the

first time, offices did not know the full extent of the risks which were upon their books, for the reason that not only were the military officers of the regular army engaged in the campaign, but a great number of civilians, who held what were technically known as whole-world policies, volunteered in the capacity of Yeomanry or Volunteers. The consequence was that probably no office was able to this day to say exactly the amount of the sum assured which it had in South Africa exposed to the risks of war. At the commencement of the campaign, military officers were somewhat surprised, and even aggrieved, when they were informed of the extra premium they had to pay, and in some instances went to the length of expressing their feelings in the public press. The offices endeavoured to make the premiums as moderate as possible, and it was a very great satisfaction to them to find that they had been fixed below rather than above the rate sufficient to cover the risk. It must be remembered that, in the case of ordinary life offices, it was the risk of the officer rather than of the non-commissioned officer or private with which they were most concerned, and whom they had most largely represented on their books. It would be found very clearly shown in Diagram A that the mortality among the officers was considerably in excess of that of all other ranks. It came out at 5·3 per-cent. per annum, which, as a previous speaker had observed, showed that the extra premium of five guineas for the first year, which was reduced subsequently to two guineas, was not sufficient to meet the risks exposed. But if the figure of 5·3 per-cent. per annum was subdivided into the three years of the war, it would be found that in the first year the mortality was as high as 7·8, necessitating, as Mr. Mackenzie observed, an extra premium of £8. The two subsequent years dropped to half that amount, 4·1. Therefore offices were right, although he did not know they followed any scientific method, in charging a higher rate of extra for the first year, which carried the heaviest mortality as it turned out, and a lower rate for the subsequent years. It might also be interesting to supplement the large and exhaustive experience of the authors of 19,000 lives by a much smaller experience which had come under his notice. In this particular instance the lives of officers only were concerned. The risks known to the society were about £180,000. To those must be added, as he had already explained, all those policies on the lives of civilians who volunteered, and who were under no necessity of reporting themselves to their insurance offices because they held whole-world policies, so that upwards of £200,000 of insurance had to be covered by extra premiums. Although he was only speaking of an isolated case, it was interesting to know that the mortality experience among that class was equal to 6 per-cent. per annum, a figure somewhat higher than that shown by the authors. The rates charged were five guineas for the first year, and two guineas for the second, and therefore were much less than sufficient to meet the risks. It occurred to him that the beneficent climate of South Africa must be to a large extent credited for the lower mortality than would otherwise have been experienced, so that in that respect the experience of the paper must not be treated as a guide to future campaigns, which might take place in much more unwholesome climates, such as tropical climates,

and less beneficial ones than South Africa. The second point which he hoped officers would consider was the great advantage to themselves of always seeing that their policies carried a small extra premium from the outset, which would cover the whole of the risks of service, foreign residence, and active warfare.

Mr. H. W. MANLY thought he was expressing the general opinion of members that the authors had done a great service to the nation in the production of their paper. It had been accomplished through the confidence and the great public spirit shown by the War Office in placing all their returns at the service of the authors, and he hoped that they would feel that their confidence had not been misplaced. If other Government departments could be induced to show the same public spirit and confidence in actuaries, far better statistical returns and results might be attained than were at present produced.

Mr. ARCH. HEWAT said that Mr. Mackenzie had referred to a return of premiums. Some members who were engaged in "other places" had found there were no premiums to return. They did not know how much was exposed to risk in South Africa, but they knew the claims which had arisen. These had not only taken away all the reserve at the credit of each of the policies, but also all the extra premiums of everyone (including the survivors) who had paid the extras demanded; notwithstanding which there was a balance on the wrong side. So that when a refund was asked for they had a very good answer to give. As Mr. Manly had said, if other departments of the Government would put a little more confidence in actuaries, he thought they might be of still greater service to the nation than they had been in the past.

Mr. GEO. TODD said he had been asked to mention the figures of a small experience with which he had been connected. The experience included nearly 1,700 lives, insured for a total of close upon half a million. The lives were almost entirely of the better class of Yeomen and Volunteers; in fact, the greater portion of them were not only passed by the army surgeons, but were also subjected to medical examination on behalf of the office which he represented, and full papers were completed, with the result that in an appreciable percentage of cases the lives, although they had been passed by the army surgeons, were declined for insurance purposes. The consequence was that there had been excluded from the experience all weakly lives, and all lives whose inherited constitution was weak. Coming shortly to the result, which did not very much differ from that shown in the paper for the insured lives, his total loss amounted to 3·38 per-cent. in lives, and a rather smaller percentage in respect of amounts assured. There were two points upon which he would like the authors to give a little more information. With reference to the experience derived from the records of the War Office, supplemented as described in the paper, it was very clearly shown how the exposed to risk was arrived at, but he did not follow in the paper with quite so much clearness the statistics as to the deaths. It was known that a great many deaths took place upon lives invalided home, some of them on the voyage home, and some of them shortly after they arrived, and it did not appear clearly in the

paper whether those deaths were included. If they were included he might point out that they were compared with a record of exposed to risk, which only included those actually upon the soil of South Africa. As to the second point, on Schedule A, on page 4, it would be noticed how fast, in the earlier stages of the war, the exposed to risk were increasing, practically 20,000 a month for some time, and the deaths were compared with those monthly figures of exposed to risk. Now, a great number of the deaths which took place in April were due to wounds received or to illness acquired in the previous month, and those deaths should properly be compared with the exposed to risk in that previous month, the effect of which, in his opinion, would be to produce a higher rate of mortality during the earlier stages of the war than that actually deduced in the paper.

Major T. McCULLOCH, M.B., said it would be found in the last return that the number of those who had died after they were sent home was 508 all told. The number was actually very small.

Mr. T. G. ACKLAND said that, having had the unfortunate fate himself to grope—he used the word advisedly—amid statistics in connection with Military and Naval operations, and to try and deduce some intelligible results from them, it was exceedingly encouraging and satisfactory to find a contribution in which the data were so fully set forth, appeared to be so thoroughly reliable, were verified from different points of view, and in which every stage of the process was most clearly and lucidly stated, so that it was possible fully to understand the course of the processes which were followed, and to discuss them with a clear appreciation of what they really meant. He was glad reference had been made in the paper to the contribution of Mr. McLauchlan, included in the thirty-fourth volume of the *Journal*, because he thought it had some value as bearing upon the subject, not directly, perhaps, on war mortality, but as to the mortality of the Army in foreign parts in time of peace, which was an allied subject. The figures set out in the present paper in connection with past wars illustrated how very rough and unsatisfactory the data had been in connection with them, notably in the case of the Crimean War. The figures had been set out notably by Mr. Mackenzie, but he was sure that gentleman must have had an immense amount of trouble to get out the data and ratios in reference to the English and French armies engaged. With regard to the Franco-German War and the American War, the statistics were certainly better, and on the present occasion one rose to what one might say was the ideal condition of things in having figures placed before them in reference to the South African War, which gave in a full and satisfactory manner the information required. The notable point in connection with the figures tabulated in the latter part of the paper especially was that they had some relation to the age. It was true that the conclusion of the authors was on the whole that the rates from disease or from wounds did not materially differ with the age, but it was satisfactory to have an investigation made into that point, and to trace the curves through the different ages of lives, and it was the first time, he thought, that had been done in connection with any military operations. It was striking to compare the ratios of

death from disease and from battle, not only of the figures in the paper, but also in reference to previous campaigns. In the long struggle of the American Civil War from 1861 to 1865, the annual death-rate from disease was truly enormous, being no less, he thought it would be found, than four times that of the deaths arising on the field of battle. During the Franco-German War, which took place a few years later, the death-rate from disease was singularly low, but that was carried on in a European country, which was on the whole a healthy one. From the German statistics it would be found that the rate of death from disease was notably below the rate of death on the field of battle. It had been stated in the present discussion that, on the whole, the rate of death in the South African War was below that with which they were familiar in connection with large national wars, but he thought if the matter was looked at from another aspect that result would be somewhat modified. One might fairly consider from their recollection of the facts, and from the valuable epitome given in the paper of the events of the war, that the South African War proper lasted during the first twelve months, in the sense that that was really the great struggle, and that the rest was a sort of guerilla warfare. During the first twelve months' operations, the death-rate was exceedingly heavy, that of the officers being $8\frac{1}{4}$ per-cent. per annum, and the N.C.O's and men practically 6 per-cent. per annum, those rates being considerably in excess of the corresponding rates per annum in the Franco-German War, which were $7\frac{1}{2}$ per-cent. per annum, and $4\frac{1}{2}$ per-cent. per annum, respectively. This indicated that the South African War was even a more serious event, judged by that standard, than the great national war between those two nations. The reference in the paper to deterioration of health, as a consequence of warlike operations, was a very interesting but a most difficult subject, and no writer had, he thought, dealt with it in an entirely satisfactory way. Mr. McLauchlan, in the paper to which he had already referred, had attempted to deal with it in a very interesting manner, upon the lines that the deterioration was represented by the difference between the H^m select mortality and the H^m normal mortality. That was confessedly an assumption, and as he did not know that it could be based either on data or on logical reasoning, one must take it for what it was worth. Turning now to the assured lives in the Yeomanry, it would be interesting if the authors could state the social position of the men, which might perhaps be roughly gauged by the average sum assured. He was not sure that the class of men was quite identical with those which they would have to deal with in most offices in insuring against military operations, and it would be interesting to hear whether that view was confirmed by the authors. Dealing with other minor matters, he would like to ask a question, on a matter which had been referred to by a previous speaker, as to the precise duration of the exposure in the case of the assured Yeomanry. In the paper it was stated: "It has been assumed that they remained exposed till the end of the month," but he fancied there must be something omitted there, because it was not quite clear what month was referred to. The difference of rate between the mortality of the assured Yeomanry and that of the Yeomanry as a whole, as deduced from the

War Office returns, was remarkable. In the assured class, the deaths from battle were 9 per 1,000, while in the Yeomanry, as a whole, they were 22 per 1,000, and the deaths from disease were 29 per 1,000 in the one class, against 33 per 1,000 in the other. The mortality was thus 38 per 1,000 as a whole for the assured class, and 55 per 1,000 for the Yeomanry generally. That seemed to be a very large difference in ratio, for which the reasons given by the authors no doubt would account in a measure; but it seemed to him to indicate that too much weight must not be given to the conclusions arrived at in respect of the assured class, and that in charging extra premiums they should have regard to the rate of 55 per 1,000 rather than to that of 38 per 1,000. He had also been a little puzzled to know why the particular process shown in Table XVI was adopted, of deducing the yearly extra premium from the monthly rates. He thought probably it must have been for some reason other than that stated in the paper; and it appeared to him that the yearly premiums could have been deduced directly from the monthly rates. He had worked out the annuity for seventeen months, payable monthly, and then, by the known relation between a term-annuity payable monthly and a term-annuity payable yearly, he arrived at a result which differed only in the third place of decimals from that deduced by the authors, and, he thought, with less work. He thought the paper deserved, and would no doubt receive, their further study, and that the discussion, lengthy and full as it had been, in no way represented the true value of this contribution to their proceedings.

The PRESIDENT (Mr. Hughes), before asking the authors to reply, congratulated them upon having presented the members with a paper of an interest surpassing that which usually formed the subject of their discussions. The interest of the paper was not merely professional and scientific, but it would be read by many people who never, under any circumstances, took any interest in matters forming the subject of most of the papers and discussions at the Institute. He thought it was no disparagement upon the authors of former investigations to say that the paper was in one respect, at all events, if not in others, superior to them all. The authors had had the advantage, with the kind assistance of the officials at the War Office, of getting their facts perfectly fresh and accurate, and having got them they had presented them in a form which was intelligible to all. He wished to emphasize Mr. Warner's remarks as to the danger of generalizing from the results of the paper, because, valuable as they were, they only represented the statistics of a particular war. Former wars were waged under different conditions, and it was to be expected that future wars would be conducted under yet other conditions of a totally different kind, so that the experience derived from the investigation must be used warily, and only as a matter of comparison, and with due regard to the circumstances to which they were applied in the future.

Mr. E. A. RUSHER, in reply, said Mr. Ackland had asked a question with reference to the social position of the men of the assured Yeomanry and Volunteers. They were taken for the most part in bulk, in battalions, and assured by public subscription for

sums generally of £250, the policies being held by trustees specially appointed for the purpose, so that there was nothing in the way of ordinary assurance selection either for or against the company. This circumstance, perhaps, might be a further reason, in addition to those given in the paper, why the rates of the Yeomanry assured lives were less than those of the Yeomanry as a whole. Especially towards the end of the war there were one or two battalions of Volunteers who suffered very heavily indeed, but they happened not to be those who were amongst the assured lives, and that in itself would have a great effect upon the resulting death-rate. Mr. Ackland had also asked how the date of return was dealt with. Probably he could explain that best by giving an example. From enquiries made it was found that one of the Yeomen returned, say, on the 15th June, 1901; that man would be taken off the risk on the 1st July, 1901, *i.e.*, he would be treated as having been at risk till the end of the month in which he was stated to have returned. The reasons for adopting that course were given in the paper. Mr. Ackland had referred to the question of deterioration, which, of course, was the great difficulty the authors had to face. They had no statistics whatever with which they could attempt to measure the effect of deterioration, although it had a very important bearing upon the premiums which should be charged for military risks. Mr. Todd had given a very interesting experience of some 1,700 lives, assured for half a million pounds, with a resulting death-rate of 3·38. That might be due to the fact that the Yeomen who were assured happened to be specially selected lives, having passed a medical examination at the office as well as the War Office ordeal. Mr. Todd had asked how the War Office deaths were recorded, and what had been done with those who died after their return to this country. The authors were supplied with manuscript volumes, which contained a record of every death that had occurred in connection with the South African War, including the 508 which took place after return to England. Those records contained the dates of death, which were very carefully noted on the cards, the deaths so obtained being set against the exposed to risk as already explained. The 508 deaths referred to were thus included in the experience, although the corresponding exposures refer only to troops actually engaged in South Africa. Mr. Mackenzie and several other speakers had referred to the difficulty of officers being called upon to pay extra premium when war broke out, and he wished to emphasize that point. It was a very great pleasure to find that assurance companies were more and more coming into line, and endeavouring to get officers to provide against the rainy day by giving them the option of paying a small extra premium throughout the whole duration of the policy instead of when the risk actually occurred. He hoped the officials from the War Office, who had honoured the Institute by their presence that evening, would do their best to impress upon officers that that was the best way of providing for the inevitable when it arrived. As to whether the Government would ever get to the happy stage, to which Mr. Mackenzie had referred, of paying the extra premium for the officers, one could only hope that that

consummation might come. He was very glad to hear Colonel Wilson strongly emphasize the effect of the length of service in hardening the soldiers, enabling them to endure the hardships of the campaign with much greater immunity from disease. He was sure all the members agreed with Mr. Manly that the kindness and courtesy experienced from the War Office, in so freely affording the authors opportunities for dealing with the matter in a scientific manner, in order that the results might be made public, was an example which they hoped would be followed by many of the other Government departments.

Mr. F. SCHOOLING, in reply, said the members would readily understand that in the preparation of the paper the authors must have had a large amount of skilled assistance, and he desired to heartily thank those gentlemen who so readily and willingly gave up their time and the benefit of their skill and brains in helping to make the paper complete. He was exceedingly pleased to hear the remarks of Surgeon-General Stevenson in regard to the concluding paragraphs of the paper. Originally it was written rather more strongly than it at present stood, because, having very closely followed the progress of the war, the authors were greatly impressed with the way in which those in authority, particularly those of the medical profession, had stuck to their work, and if the words in the paper had given any satisfaction, he was well repaid.
